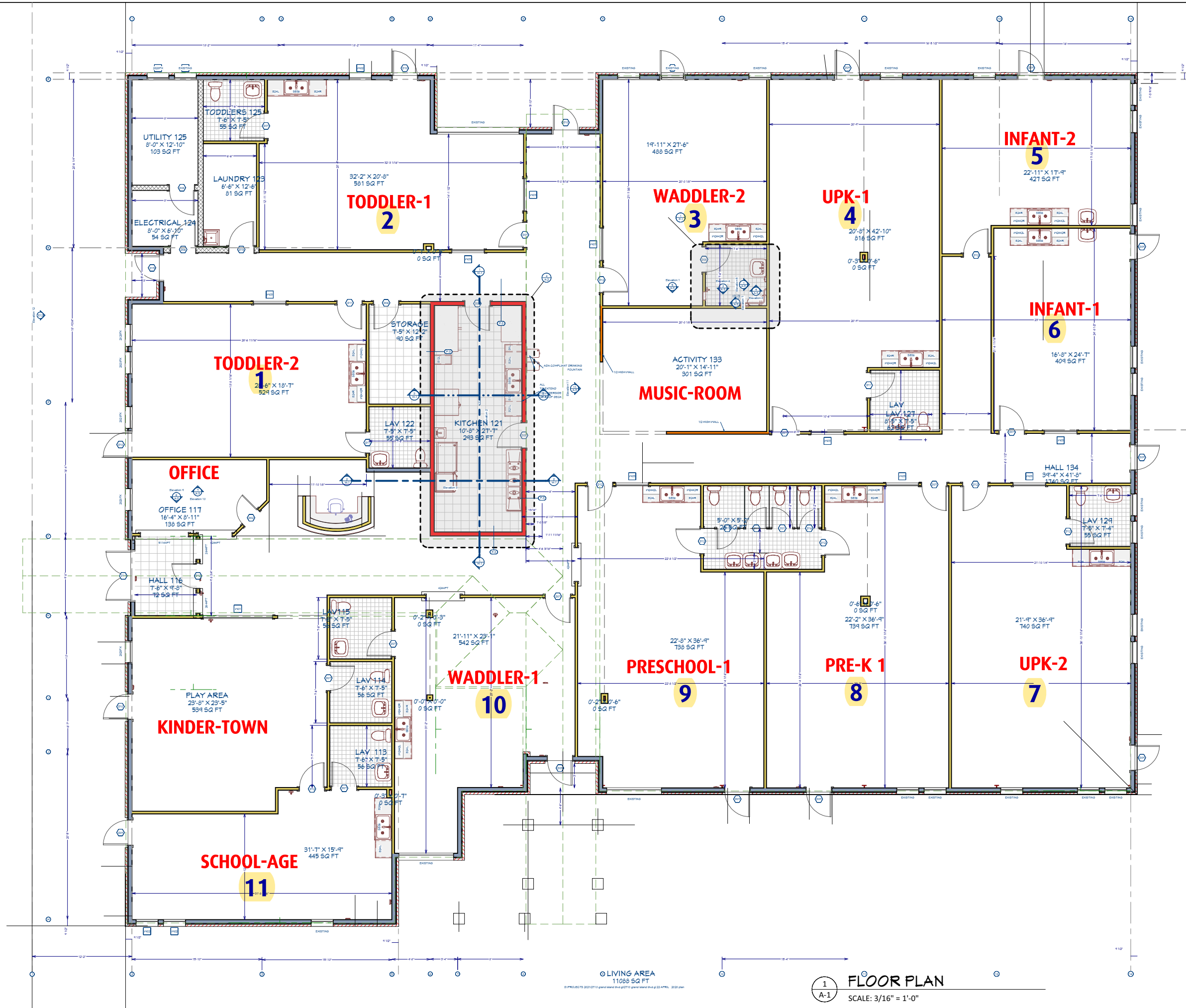




© LIVING AREA
11088 SQ FT

D:\PROJECTS\2021\2710 Grand Island Blvd g122101 Grand Island Blvd g122 APRIL 2021.dwg

1
A-1 FLOOR PLAN
SCALE: 3/16" = 1'-0"

DAY CARE CENTER
2710 GRAND ISLAND BLVD
GRAND ISLAND NY
D:\PROJECTS\2021\2710 Grand Island Blvd g122101
GRAND ISLAND BLVD G122 APRIL 2021 layout

PRINTED DATE: Thursday, April 22, 2021 15:42:50

SHEET NO.
A-1

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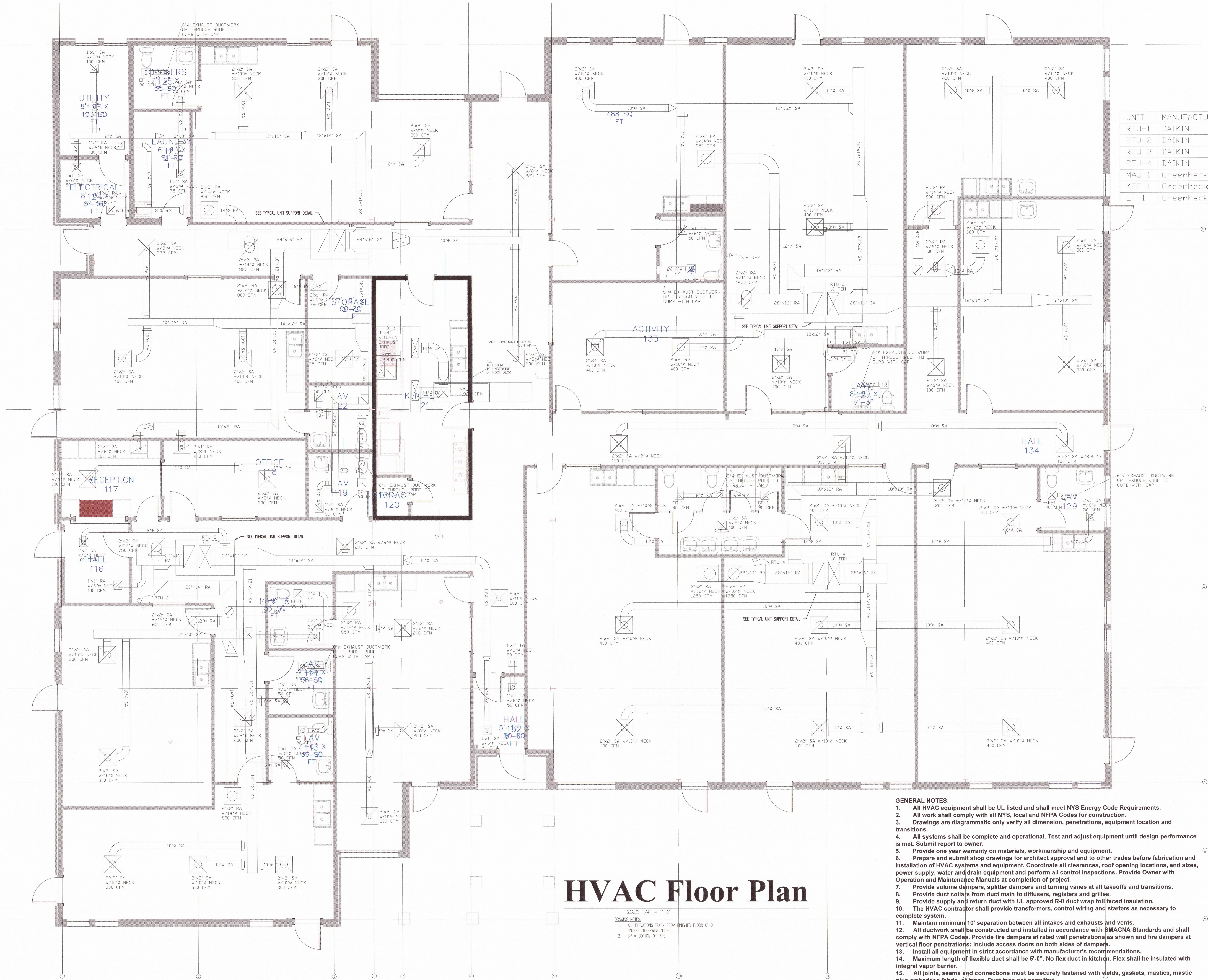


ISSUE DATE:
22 APRIL 2021
JOB NO.
DCG PROJECTS 2020
2710 GRAND ISLAND BLVD
GRAND ISLAND
Drawn By: DCG
Checked By: dcg

REVISIONS:
NO. DESCRIPTION

DATE

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Member of
The American
Institute
of Architects



UNIT	MANUFACTURER	MODEL #
RTU-1	DAIKIN	DBG090-150
RTU-2	DAIKIN	DBG090-150
RTU-3	DAIKIN	DBG120-150
RTU-4	DAIKIN	DBG120-150
MAU-1	Greenheck	DG-109-H10
KEF-1	Greenheck	GPF-30-G12
EF-1	Greenheck	SP-B90

HVAC Floor Plan

SCALE: 1/4" = 1'-0"
DRAWING NOTES:
1. ALL ELEVATIONS TAKEN FROM FINISHED FLOOR 0'-0"
UNLESS OTHERWISE NOTED
2. B' = BOTTOM OF PIPE

- GENERAL NOTES:**
- All HVAC equipment shall be UL listed and shall meet NYS Energy Code Requirements.
 - All work shall comply with all NYS, local and NFPA Codes for construction.
 - Drawings are diagrammatic only verify all dimension, penetrations, equipment location and transitions.
 - All systems shall be complete and operational. Test and adjust equipment until design performance is met. Submit report to owner.
 - Provide one year warranty on materials, workmanship and equipment.
 - Prepare and submit shop drawings for architect approval and to other trades before fabrication and installation of HVAC systems and equipment. Coordinate all clearances, roof opening locations, and sizes, power supply, water and drain equipment and perform all control inspections. Provide Owner with Operation and Maintenance Manuals at completion of project.
 - Provide volume dampers, splitter dampers and turning vanes at all takeoffs and transitions.
 - Provide duct collars from duct main to diffusers, registers and grilles.
 - Provide supply and return duct with UL approved R-8 duct wrap foil faced insulation.
 - The HVAC contractor shall provide transformers, control wiring and starters as necessary to complete system.
 - Maintain minimum 10' separation between all intakes and exhausts and vents.
 - All ductwork shall be constructed and installed in accordance with SMACNA Standards and shall comply with NFPA Codes. Provide fire dampers at rated wall penetrations as shown and fire dampers at vertical floor penetrations; include access doors on both sides of dampers.
 - Install all equipment in strict accordance with manufacturer's recommendations.
 - Maximum length of flexible duct shall be 5'-0". No flex duct in kitchen. Flex shall be insulated with integral vapor barrier.
 - All joints, seams and connections must be securely fastened with welds, gaskets, mastics, mastic plus embedded fabric, or tapes. Duct tape not permitted.



IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE LAW FOR ANY PERSONS, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT OR PROFESSIONAL ENGINEER, TO ALTER IN ANY WAY PLANS, SPECIFICATIONS, OR REPORTS TO WHICH THE SEAL OF A LICENSED ARCHITECT OR PROFESSIONAL ENGINEER HAS BEEN APPLIED.



0	ISSUED FOR REVIEW & COMMENT	03-10-2021
REV	DESCRIPTION	DATE



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3188 UNION ROAD
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KINDERKIDZ DAYCARE
SHEET METAL
GRAND ISLAND, NY

PROJECT MANAGER DWMUSKOPF	JOB NUMBER
COORDINATOR TWATT	DATE CREATED March 12, 2021
FIELD FOREMAN	SCALE 1/4" = 1'-0"

DRAWING NUMBER
SM-01-01

SPECIFICATIONS

HVAC SPECIFICATIONS

PART 1 – GENERAL

1.1 QUALITY ASSURANCE

- A. MATERIALS AND EQUIPMENT SHALL BE PROVIDED BY ONE OF THE MANUFACTURERS LISTED IN PART 2 – PRODUCTS.
1. DIVISION 23 BIDS SHALL BE BASED ON THE MATERIAL MENTIONED OR SPECIFIED, AND ANY PROPOSALS FOR A SUBSTITUTION SHALL BE MADE IN WRITING TO THE ARCHITECT / ENGINEER ALLOWING ADEQUATE TIME FOR APPROPRIATE ACTION.
- o. REFER TO DIVISION 1 REQUIREMENTS FOR SUBSTITUTION PROCEDURES.
2. MATERIALS AND EQUIPMENT FROM OTHER MANUFACTURERS MAY BE ACCEPTED IF PROVEN EQUAL TO THOSE SPECIFIED.
- o. EQUIPMENT SELECTION OF HIGHER ELECTRICAL CHARACTERISTICS, PHYSICAL DIMENSIONS, CAPACITIES, AND RATINGS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING MECHANICAL AND ELECTRICAL SERVICES, CIRCUIT BREAKERS, CONDUIT, MOTOR, BASES, AND EQUIPMENT SPACES ARE INCREASED.
- 1). DIVISION 23 ALSO IS LIABLE FOR ALL COSTS AND CHANGES IN THE WORK REQUIRED BY SUBSTITUTE EQUIPMENT.
- o). NO ADDITIONAL COSTS WILL BE APPROVED FOR THESE INCREASES, IF LARGER EQUIPMENT IS APPROVED.
- 2). IF MINIMUM ENERGY RATINGS OR EFFICIENCIES OF EQUIPMENT ARE SPECIFIED, EQUIPMENT MUST MEET DESIGN AND COMMISSIONING REQUIREMENTS.
3. DIVISION 23 IS LIABLE FOR AND SHALL PAY FOR, ALL ARCHITECTURAL AND ENGINEERING REVIEWS AND REDESIGN COSTS FOR SUBSTITUTE MATERIALS AND EQUIPMENT.
4. THE BIDDER MUST SUBMIT IN WRITING TO THE ARCHITECT / OWNER, WHO WILL FORWARD TO THE ENGINEER, A REQUEST FOR A PROPOSED DEVIATION, MODIFICATION, OR SUBSTITUTION TO THESE DRAWINGS AND SPECIFICATIONS FOR EVALUATION NO LATER THAN TEN (10) DAYS PRIOR TO THE BID DATE. PHONE CALLS, EMAILS, ETC. MADE THE DAY BEFORE AND / OR THE DAY THE BIDS ARE DUE ARE NOT ACCEPTABLE.
- o. A REQUEST FOR ANY SUBSTITUTION SHALL BE ACCOMPANIED BY TECHNICAL DATA, DRAWINGS, PRODUCT SAMPLES, AND COMPLETE DATA SUBSTANTIATING COMPLIANCE OF PROPOSED SUBSTITUTION WITH THESE SPECIFICATIONS AND DRAWINGS.
- 1). REQUESTS FOR SUBSTITUTION SHALL BE MADE ONLY BY THE BIDDER; REQUESTS FOR SUBSTITUTION FROM SALES REPRESENTATIVES, VENDORS, OR SUPPLIERS ARE NOT ACCEPTABLE.
- b. NO MATERIALS SHALL BE DEEMED ACCEPTABLE IF NOT IN STRICT AND FULL COMPLIANCE WITH THESE DRAWINGS AND SPECIFICATIONS.
- c. ALL BIDDERS MUST BID SOLELY ON THE SPECIFIED MATERIALS UNLESS ACCEPTANCE BY THE ENGINEER OF A DEVIATION, OMISSION, MODIFICATION, OR SUBSTITUTION IS GRANTED IN WRITING THROUGH THE ARCHITECT / OWNER TO ALL BIDDERS PRIOR TO THE BID DATE.
- 1). FAILURE TO SUBMIT PROPOSED SUBSTITUTED EQUIPMENT / MATERIALS PRIOR TO THE BID EVALUATION DATE, AND IS INCLUDED IN THE BIDDERS PRICE / SUBMITTAL REVIEW DRAWINGS (AFTER THE PROJECT IS AWARDED); WILL RESULT IN A "REJECTED" SUBMITTAL PACKAGE.
- B. THE LENGTH OF TIME THE MANUFACTURER HAS BEEN IN BUSINESS, THE LOCATION AND CAPABILITY OF COMPLETE REPAIR FACILITIES, AVAILABILITY OF REPAIR PARTS, AND ANNUAL MAINTENANCE CONTRACTS ALL WILL BE CONSIDERED IN DETERMINING EQUALITY.

1.2 LAWS, PERMITS, INSPECTIONS

- A. WORK SHALL COMPLY WITH THE LATEST REVISIONS OF INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL FIRE CODE, INTERNATIONAL ENERGY CONSERVATION CODE, AND ANY STATE AND LOCAL CODES OR REGULATIONS THAT APPLY.

- B. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODES AS APPLICABLE.

- C. COMPLY TO REQUIREMENTS OF DRAWINGS AND SPECIFICATIONS THAT ARE IN EXCESS OF GOVERNING CODES.

- D. DO NOT INSTALL WORK AS SPECIFIED OR SHOWN IF IN CONFLICT WITH GOVERNING CODES.

1. NOTIFY ENGINEER IN WRITING AND REQUEST DIRECTION.

- E. PAY ALL INSPECTION AND PERMIT FEES.

- F. PROVIDE CERTIFICATE OF INSPECTION FROM ALL GOVERNING AUTHORITIES.

1.3 INSTALLERS QUALIFICATIONS

- A. SKILLED MECHANICS WHO HAVE SUCCESSFULLY COMPLETED AN APPRENTICESHIP PROGRAM OR ANOTHER CRAFT TRAINING PROGRAM CERTIFIED BY THE U.S. DEPARTMENT OF LABOR, BUREAU OF APPRENTICESHIP AND TRAINING.

- B. THE MECHANICAL CONTRACTOR SHALL BE LICENSED TO PERFORM MECHANICAL WORK IN THE MUNICIPALITY IN WHICH THE PROJECT IS LOCATED.

1.4 OMISSIONS.

- A. OMISSIONS, DISCREPANCIES OR POINTS OF QUESTION FOUND BY A BIDDER IN THE PLANS OR SPECIFICATIONS SHALL BE REFERRED TO THE ARCHITECT, WHO WILL FORWARD TO THE ENGINEER TO MAKE ANY CLARIFICATIONS IN WRITING.

1.5 REQUEST FOR INFORMATION (RFI).

- A. PRIOR TO, AND DURING THE CONSTRUCTION OF THE PROJECT, QUESTIONS FROM THE HVAC CONTRACTOR REGARDING OMISSIONS, DISCREPANCIES, COORDINATION ITEMS, AND ANY OTHER CONDITIONS THAT RESULT IN CHANGES TO THE HVAC LAYOUT SHALL BE REFERRED TO THE ARCHITECT, WHO WILL MAKE ANY CLARIFICATIONS IN WRITING.

1. THE HVAC CONTRACTOR SHALL PROVIDE A DETAILED DESCRIPTION OF THE INFORMATION BEING REQUESTED ALONG WITH A DRAWING SHOWING THE AREA AND ITEMS WHERE THE CONFLICTS OCCUR AS WELL AS A PROPOSED SOLUTION TO RESOLVE THE CONFLICTS.

2. FAILURE TO PROVIDE A DETAILED DESCRIPTION AND PROPOSED SOLUTION TO THE INFORMATION BEING REQUESTED WILL RESULT IN THE ARCHITECT / ENGINEER RETURNING THE REQUEST AND REQUIRING THAT THIS BE PROVIDED BEFORE REVIEWING, ACCEPTING OR MODIFYING THE PROPOSED REQUEST.

- B. THE ENGINEER SHALL HAVE 5 (FIVE) WORKING BUSINESS DAYS (NOT INCLUDING HOLIDAYS AND VACATIONS) FROM THE DATE THAT THE ENGINEER HAS RECEIVED THEM TO REVIEW AND ISSUE A RESPONSE TO THE CONTRACTOR.

1.6 SHOP DRAWINGS

- A. DIVISION 23 SUBMITTALS SHALL BE DELIVERED TO THE ENGINEER IN FIVE (5) COMPLETE SETS, WITH FOUR (4) BEING RETURNED.

1. DIVISION 23 SHALL CHECK, SIGN, STAMP AND DATE ALL SUBMITTALS BEFORE SENDING THEM TO THE ENGINEER FOR REVIEW.

2. THE ENGINEER SHALL HAVE 10-WORKING BUSINESS DAYS (NOT INCLUDING HOLIDAYS AND VACATIONS) AFTER THE DATE THAT THE ENGINEER HAS RECEIVED THEM TO REVIEW, SIGN AND STAMP THE SUBMITTALS BEFORE RETURNING THEM TO THE ARCHITECT.

- B. PREPARE COORDINATION DRAWINGS ACCORDING TO 1/4-INCH EQUALS 1'-0" SCALE OR LARGER.

1. DETAIL MAJOR ELEMENTS, COMPONENTS AND SYSTEMS OF MECHANICAL EQUIPMENT AND MATERIALS IN RELATIONSHIP WITH OTHER SYSTEMS, INSTALLATIONS, AND BUILDING COMPONENTS.

2. INCLUDE THE FOLLOWING:

- o. PROPOSED LOCATIONS AND SIZES OF DUCTWORK, EQUIPMENT, DUCTWORK ACCESSORIES AND MATERIALS.

- b. CLEARANCES FOR SERVICING AND MAINTAINING EQUIPMENT, INCLUDING SPACE FOR EQUIPMENT DISASSEMBLY REQUIRED FOR PERIODIC MAINTENANCE.

- c. EQUIPMENT SERVICE CONNECTIONS AND SUPPORT DETAILS.

- d. EXTERIOR WALL PENETRATIONS.

- e. FIRE-RATED WALL, FLOOR AND CEILING PENETRATIONS.

- f. FLOOR PLANS, ELEVATIONS AND DETAILS TO INDICATE PENETRATIONS IN FLOORS, WALLS AND CEILINGS AND THEIR RELATIONSHIP TO OTHER PENETRATIONS AND INSTALLATIONS.

- g. REFLECTED CEILING PLANS TO COORDINATE AND INTEGRATE INSTALLATIONS, AIR OUTLETS AND INLETS, LIGHT FIXTURES, AND OTHER CEILING MOUNTED ITEMS.

1.7 RECORD (AS-BUILT) DRAWINGS

- A. DURING THE PROGRESS OF CONSTRUCTION, THE RECORD DRAWINGS SHALL BE CORRECTED BY DIVISION 23 TO INDICATE ACTUAL INSTALLATIONS.

- B. UPON COMPLETION OF THE PROJECT, 3-SETS OF FINAL RECORD DRAWINGS SHALL PRODUCED, WITH 1-SET EACH BEING DELIVERED TO THE OWNER, ARCHITECT AND ENGINEER.

1.8 PROTECTION

- A. CLOSE AND WATERPROOF BETWEEN OPENINGS AND VOIDS IN WALLS AND FLOORS TO PREVENT ENTRANCE OF WATER OR MOISTURE.

- B. SEAL ALL DUCTWORK, INCLUDING OPEN-ENDED DUCTWORK, AT THE END OF EACH DAY TO PREVENT DUST, DEBRIS, ETC. FROM ENTERING THE DUCTWORK AND PIPING.

1.9 OPERATION DURING CONSTRUCTION

- A. DIVISION 23 IS RESPONSIBLE FOR THE INSTALLATION AND OPERATION, SERVICE AND MAINTENANCE OF ALL NEW EQUIPMENT DURING CONSTRUCTION AND PRIOR TO ACCEPTANCE BY THE OWNER OF THE COMPLETED PROJECT. WARRANTY PERIODS SHALL NOT COMMENCE UNTIL FINAL ACCEPTANCE BY THE OWNER.

1.10 PROJECT COMPLETION.

- A. AT THE COMPLETION OF THE PROJECT, DIVISION 23 SHALL PROVIDE, TO THE OWNER, THREE (3) HARD BOUND VOLUMES OF MANUALS CONTAINING OPERATING SERVICE AND LUBRICATION INSTRUCTIONS, AND PARTS LISTS FOR ALL MAJOR EQUIPMENT AND MANUFACTURERS GUARANTIES OR WARRANTIES.

1.11 HVAC SCOPE OF WORK.

- A. THE WORK INCLUDED UNDER THIS CONTRACT CONSISTS OF THE PROVIDING OF ALL LABOR, MATERIALS, TOOLS, TRANSPORTATION, SERVICES, ETC., NECESSARY TO COMPLETE THE INSTALLATION THE HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS, AND OTHER ITEMS HEREIN LISTED, AND AS DESCRIBED IN THESE SPECIFICATIONS, AS ILLUSTRATED IN THE ACCOMPANYING DRAWINGS, OR AS DIRECTED BY THE OWNERS AUTHORIZED REPRESENTATIVE. HVAC WORK IS COMPRISED OF, BUT NOT LIMITED TO THE FOLLOWING PRINCIPAL ITEMS:

1. SUPPLY AND RETURN SYSTEMS INCLUDING DUCTS, GRILLES AND OUTLETS.

2. EXHAUST SYSTEMS INCLUDING FANS, DUCTS, ETC.

3. INSULATION FOR DUCTS, ETC.

4. MISCELLANEOUS EQUIPMENT REQUIRED FOR SYSTEMS.

5. TEMPERATURE CONTROLS.

1.12 GUARANTEES.

- A. DIVISION 23 SHALL GUARANTEE ALL WORK PERFORMED AND MATERIALS FURNISHED UNDER THIS CONTRACT AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF THE OWNER'S FINAL ACCEPTANCE OF THE WORK. ANY DEFECTS SHALL BE RECTIFIED BY DIVISION 23 WITHOUT ANY ADDITIONAL COST TO THE OWNER.

1.13 PUNCH LIST.

- A. DIVISION 23 SHALL SCHEDULE, THROUGH THE ARCHITECT WITH A MINIMUM OF 7-DAYS NOTICE, THE ENGINEER TO PERFORM THE FOLLOWING:

1. PRE-PUNCH LIST: VERIFICATION OF MECHANICAL ITEMS SUCH AS, BUT NOT LIMITED TO, DUCTWORK SIZES, LOCATIONS, METHODS OF ASSEMBLY / INSTALLATION, BEFORE ITEMS ARE ENCLOSED BY CEILINGS, WALLS, ETC.

- o. DIVISION 23 SHALL DELIVER TO BOTH THE ARCHITECT AND ENGINEER, A LETTER STATING THAT ALL ITEMS IN THE PRE-PUNCH LIST HAVE BEEN CORRECTED OR ADJUSTED ACCORDING TO THE GENERAL CONDITIONS OF THE CONTRACT BEFORE ANY CEILINGS, WALLS, ETC. CAN BE INSTALLED TO ENCLOSE MECHANICAL ITEMS.

2. FINAL PUNCH LIST: VERIFICATION OF MECHANICAL ITEMS SUCH AS, BUT NOT LIMITED TO, UNIT OPERATION, SENSOR LOCATIONS, COLORS SELECTED BY ARCHITECT.

- o. BEFORE PROCEEDING WITH THE FINAL PUNCH LIST, DIVISION 23 SHALL PROVIDE THE ENGINEER WITH A COMPLETE SIGNED AND SEALED BALANCE REPORT.

- 1). THE ENGINEER SHALL NOT PERFORM A FINAL PUNCH LIST UNTIL A COMPLETED BALANCE REPORT IS RECEIVED.

- b. DIVISION 23 SHALL, AT THE REQUEST OF THE ENGINEER, PROVIDE A LADDER AND ONE EMPLOYEE TO REMOVE AND REPLACE CEILING TILES, OPEN ACCESS DOORS, ETC. FOR INSPECTION OF MECHANICAL ITEMS.

- 1). THE EMPLOYEE SHALL BE MADE IMMEDIATELY AVAILABLE TO REMOVE ITEMS THAT ARE REQUESTED BY THE ENGINEER.

- 2). ANY CEILING TILE THAT IS DAMAGED SHALL BE REPLACED WITH NEW (TO MATCH EXISTING) AT DIVISION 23's EXPENSE.

- c. DIVISION 23 SHALL DELIVER TO BOTH THE ARCHITECT AND ENGINEER, A LETTER STATING THAT ALL ITEMS IN THE FINAL PUNCH LIST HAVE BEEN CORRECTED OR ADJUSTED ACCORDING TO THE GENERAL CONDITIONS OF THE CONTRACT.

PART 2 – PRODUCTS

2.1 FIRESTOPPING

- A. PROVIDE UL LISTED AND TESTED FIRESTOPPING MATERIAL, SILICONE ELASTOMER SPECIFICALLY FORMULATED FOR USE IN HORIZONTAL AND VERTICAL APPLICATIONS.

1. THE MATERIAL SHALL POSSESS INTUMESCENT CHARACTERISTICS, AND UPON EXPOSURE TO HEAT ABOVE 250° F, SHALL EXPAND TO NOT LESS THAN FIVE TIMES ITS ORIGINAL VOLUME TO FORM A FIREPROOF ENVELOPE UL RATED FOR 2 AND 3-HOURS PROTECTION, WHEN APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

- B. UNUSED SLOTS AND OTHER PENETRATIONS IN WALLS OR OTHER GENERAL CONSTRUCTION SHALL BE CLOSED AND SEALED WITH AN APPROVED FIRESTOPPING MATERIAL.

1. DUCT OPENINGS IN WALLS SHALL BE CLOSED WITH 16-GAUGE GALVANIZED STEEL SHEET SECURELY ATTACHED AT THE MIDPOINT OF THE WALL THICKNESS AND FIRESTOPPED ON BOTH SIDES OF THE STEEL SHEET WITH NOT LESS THAN 1/8-INCH THICK LAYER OF NON-SAGGING SILICONE ELASTOMER TO FULLY COVER THE OPENING.

- C. DUCTS: THE ANNULUS BETWEEN DUCTWORK AND WALLS IN FINISHED SPACES SHALL BE FILLED, SEALED, AND PAINTED TO MATCH ADJACENT SURFACES.

1. WHERE DUCTWORK PASSES THROUGH A FIRE-RATED WALL ASSEMBLY, AND THERE ARE NO FIRE DAMPERS SHOWN ON THE PLANS (DUCTWORK SIZE IS LESS THAN 100 SQUARE INCHES), PROVIDE THE FOLLOWING, MINIMUM:

- o. A MINIMUM OF 12-INCH LONG BY 0.060-INCH THICK STEEL SLEEVE SHALL BE CENTERED IN EACH DUCT OPENING.

- b. THE SLEEVE SHALL BE SECURED TO BOTH SIDES OF THE WALL / CEILING AND ALL FOUR SIDES OF THE SLEEVE WITH A MINIMUM OF 1-1/2" x 1-1/2" x 0.060" STEEL RETAINING ANGLES.

- c. THE RETAINING ANGLES SHALL BE SECURED TO THE SLEEVES AND THE WALL / CEILING WITH NO. 10 (M5) SCREWS.

- d. THE ANNULAR SPACE BETWEEN THE STEEL SLEEVE AND WALL / CEILING SHALL BE FILLED WITH SILICONE ELASTOMER TO PROVIDE A MINIMUM 2-HOUR RATED FIRESTOP.

2.2 MECHANICAL IDENTIFICATION

- A. DUCT IDENTIFICATION DEVICES.

1. PLASTIC DUCT MARKERS: MANUFACTURERS STANDARD LAMINATED PLASTIC, COLOR CODED, CONTACT-TYPE, PERMANENT ADHESIVE.

- o. LETTER SIZE: MINIMUM 1/4" FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 2'-0", 1/2" FOR VIEWING DISTANCES UP TO 6'-0", AND PROPORTIONALLY LARGER LETTERING FOR GREATER VIEWING DISTANCES.

- b. CONFORM TO THE FOLLOWING COLOR CODE:

- 1). GREEN: RETURN AIR.

- 2). YELLOW: SUPPLY AIR.

- 3). BLUE: EXHAUST AIR.

- 4). NOMENCLATURE: INCLUDE THE FOLLOWING, AS A MINIMUM:

- o). DIRECTION OF AIRFLOW.

- b). DUCT SERVICE (SUPPLY, RETURN, EXHAUST, ETC.).

2. LOCATE DUCT MARKERS NEAT POINTS WHERE DUCTS ENTER INTO CONCEALED SPACES AND AT MAXIMUM INTERVALS OF 25'-0" IN EACH SPACE WHERE DUCTS ARE EXPOSED OR CONCEALED BY REMOVABLE CEILING SYSTEMS.

- B. EQUIPMENT IDENTIFICATION DEVICES.

1. EQUIPMENT NAMEPLATES: METAL NAMEPLATE WITH OPERATIONAL DATA ENGRAVED OR STAMPED, PERMANENTLY ATTACHED TO EQUIPMENT.

- o. DATA: MANUFACTURER, PRODUCT NAME, MODEL NUMBER, SERIAL NUMBER, CAPACITY, OPERATING AND POWER CHARACTERISTICS, LABELS OF TESTED COMPLIANCES, AND SIMILAR ESSENTIAL DATA.

- 1). ENGRAVING: MANUFACTURER'S STANDARD LETTER STYLE, OF SIZES AND WITH TERMS TO MATCH EQUIPMENT IDENTIFICATION.

- 2). THICKNESS: 1/16 INCH FOR UNITS UP TO 20 SQUARE INCHES OR 8-INCHES IN LENGTH, AND 1/8 INCH FOR LARGER UNITS.

- b. LOCATION: AN ACCESSIBLE AND VISIBLE LOCATION.

- c. FASTENERS: AS REQUIRED TO MOUNT ON EQUIPMENT.

2. DUCT ACCESS DOOR MARKERS: 1/16-INCH THICK, ENGRAVED LAMINATED PLASTIC, WITH ABBREVIATED TERMS AND NUMBERS CORRESPONDING TO IDENTIFICATION.

- o. PROVIDE 1/8-INCH CENTER HOLE FOR ATTACHMENT.

- b. FASTENERS: SELF-TAPPING, STAINLESS-STEEL SCREWS OR CONTACT-TYPE, PERMANENT ADHESIVE.

2.3 SHEET METAL MATERIALS

- A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS, UNLESS OTHERWISE INDICATED.

1. SHEET METAL MATERIALS SHALL BE FREE FROM VISUAL IMPERFECTIONS INCLUDING PITTING, SEAM MARKS, ROLLER MARKS, OIL CANNING, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS, INCLUDING THOSE WHICH WOULD IMPAIR PAINTING.

- B. GALVANIZED SHEET STEEL.

1. LOCK-FORMING QUALITY; COMPLYING WITH ASTM A653/A653M AND HAVING G90 ZINC COATING DESIGNATION; DUCTS SHALL HAVE MILL-PHOSPHATIZED FINISH FOR SURFACES EXPOSED TO VIEW.

2.4 SHEET METAL SEALANT MATERIALS

- A. MASTIC: NON-HARDENING, NON-MIGRATING MASTIC ELASTIC SEALANT SPECIFICALLY FOR SEALING JOINTS AND SEAMS IN DUCTWORK.

- B. WATER-BASED JOINT AND SEAM SEALANT: FLEXIBLE, ADHESIVE SEALANT, RESISTANT TO UV LIGHT WHEN CURED, UL 723 LISTED, AND COMPLYING WITH NFPA REQUIREMENTS FOR CLASS 1 DUCTS.

- C. SOLVENT-BASED JOINT AND SEAM SEALANT: ONE-PART, NONSAG, SOLVENT-RELEASE-CURING, POLYMERIZED BUTYL SEALANT FORMULATED WITH A MINIMUM OF 75 PERCENT SOLIDS.

2.5 DUCTWORK INSULATION

- A. FIRE-TEST RESPONSE CHARACTERISTICS.

1. FLAME-SPREAD RATING OF 25 OR LESS, AND SMOKE-DEVELOPED RATING OF 50 OR LESS; COMPLYING WITH ASTM E-84.

- B. INSULATION MATERIALS.

1. MINERAL-FIBER BLANKET THERMAL INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN, WITHOUT FACING AND WITH ALL SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM.

2.6 DUCTWORK ACCESSORIES

- A. VOLUME DAMPERS.

1. LOW LEAKAGE VOLUME DAMPERS: MULTIPLE OR SINGLE-BLADE, OPPOSED BLADE DESIGN, LOW LEAKAGE RATING, LINKAGE OUTSIDE OF AIRSTREAM, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.

- o. STEEL FRAMES: HAT-SHAPED, GALVANIZED SHEET STEEL CHANNELS, MINIMUM OF 0.064" THICK, WITH MITERED AND WELDED CORNERS; FRAMES WITH FLANGES FOR ATTACHING TO WALLS, FLANGELESS FRAMES FOR INSTALLATION IN DUCTS.

- b. ROLL-FORMED STEEL BLADES: 0.064" THICK, GALVANIZED SHEET STEEL.

- c. BLADE AXLES: 1/2", GALVANIZED STEEL.

- d. BEARINGS: TWO-PIECE MOLDED SYNTHETIC THRUST OR BALL.

- e. BLADE SEALS: FELT OR NEOPRENE.

- f. JAMB SEALS: CAMBERED STAINLESS STEEL.

- g. TIE BARS AND BRACKETS: GALVANIZED STEEL.

- h. FINISH: MILL.

2. JACKSHAFT: 1" DIAMETER, GALVANIZED STEEL PIPE ROTATING WITHIN PIPE-BEARING ASSEMBLY MOUNTED ON SUPPORTS AT EACH MULLION AND AT EACH END OF MULTIPLE DAMPER ASSEMBLIES.

3. DAMPER HARDWARE: ZINC-PLATED, DIE-CAST CORE WITH DIAL AND HANDLE MADE OF 3/32" THICK ZINC-PLATED STEEL, AND A 3/4" HEXAGON LOCKING NUT.

- o. INCLUDE CENTER HOLE TO SUIT DAMPER OPERATING-ROD SIZE. INCLUDE ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.

4. DUCT ACCESSORY HARDWARE.

- o. QUADRANT LOCKS: PROVIDE FOR EACH VOLUME DAMPER, QUADRANT LOCK DEVICE ON ONE END OF SHAFT, AND END BEARING PLATE ON OTHER END FOR DAMPER LENGTHS OVER 12".

- 1). PROVIDE EXTENDED QUADRANT LOCKS FOR EXTERNALLY INSULATED DUCTWORK.

- 2). MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE QUADRANT LOCKS OF ONE OF THE FOLLOWING:

- o). VENT FABRICS, INC.

- b). YOUNG REGULATOR COMPANY.

5. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE VOLUME DAMPERS OF ONE OF THE FOLLOWING:

- o. AIR BALANCE, INC.

- b. GREENHECK

- c. MCGILL AIRFLOW CORPORATION.

- d. RUSKIN COMPANY.

B. DUCT-MOUNTING ACCESS DOORS.

1. DESCRIPTION: FABRICATE DOORS AIRTIGHT AND SUITABLE FOR DUCT PRESSURE CLASS.

- o. PROVIDE ACCESS DOORS IN DUCTS FOR READY ACCESS TO OPERATING PARTS INCLUDING FIRE DAMPERS, ETC.

2. ACCESS DOORS IN DUCTS – PROVIDE AND SIZE DOOR AS FOLLOWS:

- o. INSTALL THE FOLLOWING MINIMUM SIZES FOR DUCT-MOUNTING, RECTANGULAR ACCESS DOORS:

- 1). HEAD AND HAND ACCESS: 18 BY 10 INCHES.

- b. INSTALL THE FOLLOWING MINIMUM SIZES FOR DUCT-MOUNTING, ROUND ACCESS DOORS:

- 1). HEAD AND HAND ACCESS: 12 INCHES IN DIAMETER.

- c. WHEN FIELD CONDITIONS REQUIRE AN ACCESS OPENING SMALLER THAN 18-INCH BY 10-INCH OR 12-INCHES IN DIAMETER, PROVIDE A 24-INCH LONG REMOVABLE SECTION OF CASING OR DUCT, SECURED WITH QUICK ACTING LOCKING DEVICES, 6 INCHES ON CENTERS, TO PERMIT READY ACCESS WITHOUT DISMANTLING OTHER EQUIPMENT.

- d. LABEL FIRE DAMPERS ACCESS DOORS IN ACCORDANCE WITH NFPA AND DRAWINGS.

3. RECTANGULAR DOORS: MINIMUM 22-GAUGE, DOUBLE-WALL, DUCT MOUNTING, FABRICATED OF GALVANIZED SHEET METAL (OR MATERIAL MATCHING ADJOINING DUCTWORK).

- 1). INCLUDE CONTINUOUS PIANO HINGE AND CAM LATCHES.

- 2). FRAME: MINIMUM 22-GAUGE GALVANIZED SHEET STEEL, WITH BEND-OVER TABS AND FOAM GASKETS.

- 3). LOCKS: MINIMUM 16-GAUGE GALVANIZED STEEL CAM AND 20-GAUGE GALVANIZED STEEL LATCH.

- 4). ARRANGE DOORS SO THAT SYSTEM AIR PRESSURE WILL ASSIST CLOSURE AND PREVENT OPENING WHEN THE SYSTEM IS IN OPERATION.

- 5). MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE RECTANGULAR ACCESS DOORS OF ONE OF THE FOLLOWING:

- o). DUCTMATE INDUSTRIES, INC.

- b). MCGILL AIRFLOW CORPORATION.

- c). RUSKIN COMPANY.

4. ROUND DOORS: MINIMUM 22-GAUGE, DOUBLE WALL, DUCT MOUNTING; FABRICATED OF GALVANIZED SHEET METAL (OR MATERIAL MATCHING ADJOINING DUCTWORK).

- 1). INCLUDE CAM LATCHES.

- 2). FRAME: MINIMUM 22-GAUGE GALVANIZED SHEET STEEL, WITH SPIN-IN NOTCHED FRAME.

- 3). ARRANGE DOORS SO THAT SYSTEM AIR PRESSURE WILL ASSIST CLOSURE AND PREVENT OPENING WHEN THE SYSTEM IS IN OPERATION.

- 4). MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ROUND ACCESS DOORS BY ONE OF THE FOLLOWING:

- o). DUCTMATE INDUSTRIES, INC.

- b). FLEXMASTER U.S.A., INC.

5. SEAL AROUND FRAME ATTACHMENT TO DUCT AND DOOR TO FRAME WITH NEOPRENE OR FOAM RUBBER GASKET.

6. INSULATION: 1-INCH THICK, FIBROUS-GLASS OR POLYSTYRENE-FOAM BOARD.

C. CEILING AND WALL ACCESS DOORS.

1. WHERE CEILINGS AND WALLS MUST BE PENETRATED FOR ACCESS TO MECHANICAL WORK, PROVIDE TYPES OF ACCESS DOORS INDICATED.

- o. FURNISH SIZES INDICATED OR, WHERE NOT OTHERWISE INDICATED, FURNISH ADEQUATE SIZE FOR INTENDED AND NECESSARY ACCESS.

- 1). HEAD AND HAND ACCESS MINIMUM SIZES FOR RECTANGULAR ACCESS DOORS: 20 INCHES BY 12 INCHES.

- b. FURNISH MANUFACTURER'S COMPLETE UNITS, OF TYPE RECOMMENDED FOR APPLICATION IN INDICATED SUBSTRATE CONSTRUCTION, IN EACH CASE, COMPLETE WITH ANCHORAGES AND HARDWARE.

2. CONSTRUCTION: EXCEPT AS OTHERWISE INDICATED, FABRICATE CEILING AND WALL DOOR UNITS OF WELDED STEEL CONSTRUCTION WITH WELDS GROUND SMOOTH, 16-GAUGE FRAMES AND 14-GAUGE FLUSH PANEL DOORS, 175 DEGREE SWING WITH CONCEALED SPRING HINGES, FLUSH SCREWDRIVER OPERATED CAM LOCKS, FACTORY APPLIED BURN-INHIBITIVE PRIME COAT PAINT FINISH (FINISH COLOR AS SELECTED BY ARCHITECT).

3. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE CEILING AND WALL ACCESS DOORS OF ONE OF THE FOLLOWING:

- o. MILCOR DIV., INFRCO INC.

- b. SMITH (JAY R.) MFG. CO.

- c. ZURN INDUSTRIES, INC.

D. FIRE DAMPERS.

1. DESCRIPTION: LABELED ACCORDING TO UL 555, AND UL 555C (FIRE RATED CEILINGS WITH WOOD JOIST / TRUSS CONSTRUCTION), HORIZONTAL OR VERTICAL MOUNTING, MILL FINISH.

- o. FIRE RATING: 1-1/2 HOURS AND 2 HOURS.

- b. FRAME: CURTAIN TYPE WITH BLADES OUT

SPECIFICATIONS

HVAC SPECIFICATIONS (cont'd)

E. FLEXIBLE CONNECTORS.

1. DESCRIPTION: FLAME RETARDANT OR NON-COMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1.
- a. FABRIC: GLASS FABRIC DOUBLE COATED WITH NEOPRENE.
- b. METAL EDGE CONNECTORS: FACTORY FABRICATED WITH A FABRIC STRIP 3-1/2" WIDE ATTACHED TO TWO STRIPS OF 2-3/4" WIDE, 0.028" THICK GALVANIZED SHEET STEEL OR 0.032" THICK ALUMINUM SHEETS.
- 1). SELECT METAL COMPATIBLE WITH DUCTS.
2. ATTACHMENTS: ATTACH TO EQUIPMENT CONNECTIONS AS SPECIFIED BY MANUFACTURER AND AS SHOWN ON THE DRAWINGS.
- a. LENGTH: LIMIT FLEXIBLE CONNECTIONS TO 4" ACTIVE LENGTH IN DIRECTION OF AIRFLOW.
3. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE FLEXIBLE CONNECTORS OF ONE OF THE FOLLOWING:
- a. DUCTMATE INDUSTRIES, INC.
- b. DURO DYNE CORPORATION.
- c. VENTFABRICS, INC.

F. FLEXIBLE DUCTS.

1. INSULATED FLEXIBLE DUCTS: UL 181, CLASS 1; BLACK POLYMER FILM SUPPORTED BY HELICALLY WOUND, SPRING-STEEL WIRE; 1" THICK FIBROUS-GLASS INSULATION; ALUMINUM VAPOR BARRIER FILM; MAXIMUM 5'-0" IN LENGTH.
2. FLEXIBLE DUCT CLAMPS: STAINLESS STEEL BAND WITH CADMIUM-PLATED HEX SCREW TO TIGHTEN BAND WITH A WORM-GEAR ACTION, IN SIZES TO SUIT DUCT SIZE.
3. FLEXIBLE DUCT FITTINGS: FACTORY FABRICATED GALVANIZED STEEL FITTINGS.
- a. USE 45-DEGREE LATERALS, BALL MOUTH TEES, SPIN COLLARS, OR CONICAL TEES FOR DUCT TAPS.
- b. 90-DEGREE TEES ARE NOT ALLOWED.
4. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE FLEXIBLE DUCTS OF ONE OF THE FOLLOWING:
- a. FLEXMASTER U.S.A., INC.
- b. MCGILL AIRFLOW CORPORATION.

G. MOTORIZED CONTROL DAMPERS.

1. DESCRIPTION: OPPOSED-BLADE DESIGN WITH INFLATABLE SEAL BLADE EDGING, OR REPLACEABLE RUBBER SEALS, AMCA RATED AND TESTED TO AMCA 500D.
- a. FRAME: 5"x1"x16-GAUGE GALVANIZED STEEL HAT CHANNEL REINFORCED WITH CORNER BRACES EQUAL TO 13-GAUGE CHANNEL FRAMES (3-1/2"x3/8"x16-GAUGE TOP AND BOTTOM ON 12" HIGH OR LESS) AND HOLES FOR DUCT MOUNTING.
- b. BLADES: 6" WIDE, 14-GAUGE GALVANIZED STEEL AIRFOIL SHAPE, DOUBLE-SKIN CONSTRUCTION.
- 1). SECURE BLADES TO 1/2" REMOVABLE DIAMETER, ZINC-PLATED AXLES USING ZINC-PLATED HARDWARE, WITH NYLON BLADE BEARINGS, BLADE-LINKAGE HARDWARE OF ZINC-PLATED STEEL AND BRASS (CONCEALED IN FRAME), ENDS SEALED AGAINST SPRING-STAINLESS STEEL BLADE BEARINGS, AND THRUST BEARINGS AT EACH END OF EVERY BLADE.
- c. LEAKAGE RATE: NOT GREATER THAN 4 CFM / FT2 OF DAMPER SURFACE AREA AT 1.0 INCH WATER GAUGE.
2. MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE MOTORIZED CONTROL DAMPERS OF ONE OF THE FOLLOWING:
- a. AIR BALANCE, INC.
- b. GREENHECK.
- c. RUSKIN COMPANY.

2.7 DIFFUSERS, REGISTERS AND GRILLES

- A. CEILING COMPATIBILITY: PROVIDE DIFFUSERS AND GRILLES WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT CEILING SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO CEILING MODULE AND WITH ACCURATE FIT AND ADEQUATE SUPPORT.
- B. WALL COMPATIBILITY: PROVIDE REGISTERS AND GRILLES WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT WALL SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO WALL CONSTRUCTION WITH ACCURATE FIT AND ADEQUATE SUPPORT.
- C. PERFORMANCE: PROVIDE CEILING AND WALL DIFFUSERS / GRILLES THAT HAVE, AS MINIMUM, TEMPERATURE AND VELOCITY TRAVERSES, THROW AND DROP, AND NOISE CRITERIA RATINGS FOR EACH SIZE DEVICE AS LISTED IN MANUFACTURERS CURRENT DATA.
1. NOISE LEVELS OF NC 20 OR LESS.
- D. SQUARE CEILING SUPPLY DIFFUSERS.
1. LOUVERED FACE CEILING DIFFUSERS.
- a. MATERIAL: STEEL.
- b. FINISH: BAKED ENAMEL, WHITE.
- c. FACE SIZE:
- 1). 24"x24" SQUARE: PROVIDE 18"x18" BACKPAN (NECK SIZE AS SHOWN ON DRAWINGS FOR FULL PANEL APPLICATION) WITH FULL FACE DIFFUSER, EASILY REMOVABLE CORE OF CONCENTRIC LOUVERS (FLUSH WITH FACE), SQUARE OR ROUND DUCT CONNECTION.
- a). MINIMUM 22-GAUGE STEEL BACKPAN (WELDED-IN INLETS AND CORNER JOINTS ARE NOT ACCEPTABLE).
- d. MOUNTING: T-BAR (LAY-IN), SURFACE
- e. PATTERN (THROW): 4-WAY, FIXED, HORIZONTAL DISCHARGE.
- f. DAMPERS: ADJUSTABLE, OPPOSED-BLADE, KEY OPERATED FROM FACE OF DIFFUSER.
- g. ACCESSORIES:
- 1). SQUARE TO ROUND NECK ADAPTOR.
- 2). PLASTER RING.
- E. CEILING RETURN AND EXHAUST GRILLES.
1. MATERIAL: STEEL.
2. FINISH: BAKED ENAMEL, WHITE.
3. FACE STYLE: FLUSH, HOUSING COVERED WITH REMOVABLE PERFORATED PANEL (PERFORATED SCREEN WITH 3/16" DIAMETER HOLES ON 1/4" STAGGERED CENTERS) IN FRAME, MINIMUM 51% FREE AREA.
4. FACE SIZE:
- a. 24"x24" SQUARE: MINIMUM 22-GAUGE STEEL, PROVIDE 22"x22" BACKPAN (NECK SIZE AS SHOWN ON DRAWINGS, STANDARD NECK SIZE WHERE NOT INDICATED).
- 1). MINIMUM 22-GAUGE STEEL BACKPAN (WELDED-IN INLETS AND CORNER JOINTS ARE NOT ACCEPTABLE).
- b. 24"x48" SQUARE: MINIMUM 22-GAUGE STEEL, PROVIDE 22"x46" BACKPAN (NECK SIZE AS SHOWN ON DRAWINGS, STANDARD NECK SIZE WHERE NOT INDICATED).
- 1). MINIMUM 22-GAUGE STEEL BACKPAN (WELDED-IN INLETS AND CORNER JOINTS ARE NOT ACCEPTABLE).
5. MOUNTING: LAY-IN (T-BAR), SURFACE.
6. DAMPERS: ADJUSTABLE, OPPOSED-BLADE, KEY OPERATED FROM FACE OF DIFFUSER.
7. ACCESSORIES:
- a. SQUARE TO ROUND NECK ADAPTOR.
- b. PLASTER RING.

F. SURFACE MOUNTED SUPPLY, RETURN AND EXHAUST REGISTERS AND GRILLES.

1. ADJUSTABLE BAR GRILLE - SUPPLY.
- a. MATERIAL: STEEL FITTED WITH FELT OR NEOPRENE GASKET AND ADJUSTABLE BLADES.
- b. FINISH: BAKED ENAMEL, COLOR AS SELECTED BY ARCHITECT.
- c. FACE BLADE ARRANGEMENT: SPACED 3/4" APART, INDIVIDUALLY ADJUSTABLE HORIZONTAL BLADES.
- d. GRILLE PATTERN: LOUVERED FACE, DOUBLE-DEFLECTION, TWO SETS OF BLADES IN FACE, 22" DEFLECTION.
- e. REAR BLADE ARRANGEMENT: SET AT 90-DEGREES TO FACE AND SPACED 3/4" APART.
- f. FRAME: MINIMUM 20-GAUGE, 1-1/4" WIDE.
- g. MOUNTING: SURFACE WITH COUNTERSUNK PHILLIPS SCREWS.
- h. DAMPERS: ADJUSTABLE, OPPOSED-BLADE, FORMED STEEL, CADMIUM PLATED, GANG KEY OPERATED, AND ARRANGED SO THAT THE OPERATING MECHANISM DOES NOT PROJECT THROUGH ANY PART OF THE GRILLE FACE.
2. FIXED FACED REGISTER - RETURN AND EXHAUST.
- a. MATERIAL: ALUMINUM, FITTED WITH FELT OR NEOPRENE GASKET AND FIXED BLADES.
- b. FINISH: BAKED ENAMEL, COLOR AS SELECTED BY ARCHITECT.
- c. FACE BLADE ARRANGEMENT: SPACED 3/4" APART, BLADES PARALLEL TO HORIZONTAL DIMENSION, 35-DEGREE DEFLECTION.
- d. FRAME: MINIMUM 20-GAUGE, 1-1/4" WIDE.
- e. MOUNTING: SURFACE WITH COUNTERSUNK PHILLIPS SCREWS.
- f. DAMPERS: ADJUSTABLE, OPPOSED-BLADE, FORMED STEEL, CADMIUM PLATED, GANG KEY OPERATED, AND ARRANGED SO THAT THE OPERATING MECHANISM DOES NOT PROJECT THROUGH ANY PART OF THE GRILLE FACE.

G. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE DIFFUSERS, REGISTERS AND GRILLES OF ONE OF THE FOLLOWING:

1. PRICE INDUSTRIES.
2. TITUS.

PART 3 - TESTING, ADJUSTING AND BALANCING

3.1 TESTING, ADJUSTING AND BALANCING

- A. GENERAL: MULTIPLE MOBILIZATIONS ARE REQUIRED PER EACH COMPLETED WORK AREA / PHASE (I.e. PRIOR TO OWNER'S OCCUPANCY SPACE).
1. HVAC PRIME CONTRACTOR SHALL REVIEW THE PHASING PLANS AND INCLUDE IN BASE BID, SEPARATE BALANCE REPORTS FOR EACH COMPLETED AREA OF WORK.
- B. AIR BALANCING CONTRACTOR SHALL INCLUDE, IN THEIR PRICING, ONE SHEAVE CHANGE FOR EACH ROOFTOP UNIT TO BE INSTALLED AT COMPLETION OF PROJECT, IF NECESSARY.
1. SHEAVES AND BELT ADJUSTMENTS SHALL BE SET IN ACCORDANCE WITH THE UNIT MANUFACTURER RECOMMENDATIONS AND WITH FACTORY-AUTHORIZED SERVICE REPRESENTATIVE PRESENT, IN ORDER TO MAINTAIN MAXIMUM BELT LIFE.
- C. TAB FIRM QUALIFICATIONS: ENGAGE A TAB FIRM CERTIFIED BY EITHER ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).
1. A SPECIALIST WITH AT LEAST 5-YEARS OF EXPERIENCE IN THOSE TESTING, ADJUSTING AND BALANCING REQUIREMENTS SIMILAR TO THOSE REQUIRED FOR THIS PROJECT.
- a. SUBMIT BIOGRAPHICAL DATA ON TAB SUPERVISOR WHO IS DIRECTLY SUPERVISING TESTING, ADJUSTING AND BALANCING WORK.
- b. SUBMIT THE INDIVIDUAL QUALIFICATIONS OF ALL PERSONS RESPONSIBLE FOR SUPERVISING AND PERFORMING THE ACTUAL WORK.
- D. TAB FORM REPORTS: USE STANDARD FORMS FROM AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING,, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING AND BALANCING OF ENVIRONMENTAL SYSTEMS".
- E. INSTRUMENTATION TYPE, QUANTITY AND ACCURACY: AS DESCRIBED IN AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING,, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING AND BALANCING OF ENVIRONMENTAL SYSTEMS", SECTION II, "REQUIRED INSTRUMENTATION FOR NEBB CERTIFICATION".
1. CALIBRATE INSTRUMENTS AT LEAST EVERY 6-MONTHS OR MORE FREQUENTLY IF REQUIRED BY INSTRUMENT MANUFACTURER.
- a. PROVIDE UPDATED RECORD OF INSTRUMENT CALIBRATION THAT INDICATES DATE OF CALIBRATION AND THE NAME OF THE PARTY PERFORMING INSTRUMENT CALIBRATION.
- F. PROJECT CONDITIONS.
1. GENERAL: DO NOT PROCEED WITH TESTING, ADJUSTING AND BALANCING WORK UNTIL THE FOLLOWING CONDITIONS HAVE BEEN MET.
- a. WORK HAS BEEN COMPLETED AND IS OPERABLE.
- b. WORK SCHEDULED FOR TESTING, ADJUSTING AND BALANCING IS CLEAN AND FREE FROM DEBRIS, DIRT AND DISCARDED BUILDING MATERIALS.
- c. ALL ARCHITECTURAL OPENINGS (DOORS, WINDOWS, AND OTHER OPENINGS) WHICH MAY AFFECT THE OPERATION OF THE SYSTEM TO BE TESTED, ADJUSTED AND BALANCED SHALL BE AT THEIR NORMAL STATES.
- d. ALL RELATED MECHANICAL SYSTEMS, WHICH MAY AFFECT THE OPERATION OF THE SYSTEM TO BE TESTED, ADJUSTED AND BALANCED SHALL BE AT THEIR NORMAL OPERATING CONDITIONS; COORDINATE WITH CONTROLS CONTRACTOR.
- e. UNIT FILTERS ARE NOT "LOADED"; MECHANICAL CONTRACTOR SHALL REPLACE, IF REQUIRED, PRIOR TO BALANCING.
- G. GENERAL PROCEDURES FOR TESTING AND BALANCING.
1. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS".
2. TEST, ADJUST AND BALANCE SYSTEMS DURING NEAR-PEAK SUMMER SEASON FOR AIR CONDITIONING SYSTEMS AND DURING NEAR-PEAK WINTER SEASON FOR HEATING SYSTEMS, INCLUDING AT LEAST A PERIOD OF OPERATION AT OUTSIDE CONDITIONS WITHIN 5 DEGREE F (3 DEGREE C) WET BULB TEMPERATURE OF MAXIMUM SUMMER DESIGN CONDITION, AND WITHIN 10 DEGREE F (6 DEGREE C) DRY BULB TEMPERATURE OF MINIMUM WINTER DESIGN CONDITION. WHEN SEASONAL OPERATION DOES NOT PERMIT MEASURING FINAL TEMPERATURES, THEN TAKE FINAL TEMPERATURE READINGS WHEN SEASONAL OPERATION DOES PERMIT.
- a. TEST DURATION: OPERATING TESTS OF EQUIPMENT SHALL BE OF NOT LESS THAN FOUR (4) HOURS DURATION AFTER STABILIZED OPERATING CONDITIONS HAVE BEEN ESTABLISHED.
3. MARK EQUIPMENT AND BALANCING DEVICE SETTINGS WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL, INCLUDING DAMPER-CONTROL POSITIONS, FAN-SPEED CONTROL LEVERS, AND SIMILAR CONTROL DEVICES, TO SHOW FINAL SETTINGS.

H. PROCEDURES FOR SOUND-LEVEL MEASUREMENTS.

1. PERFORM SOUND-PRESSURE-LEVEL MEASUREMENTS WITH AN OCTAVE-BAND ANALYZER COMPLYING WITH ANSI S-1.4 FOR TYPE 1 SOUND-LEVEL METERS AND ANSI S-1.11 FOR OCTAVE-BAND FILTERS.
2. PERFORM SOUND-LEVEL TESTING AFTER AIR BALANCING AND EQUIPMENT TESTING ARE COMPLETE.
- a. PERFORM THE MEASUREMENTS WHEN THE SPACE IS NOT OCCUPIED AND WHEN THE OCCUPANT NOISE LEVEL FROM OTHER SPACES IN THE BUILDING AND OUTSIDE ARE AT A MINIMUM.
3. TAKE SOUND MEASUREMENTS AT A HEIGHT APPROXIMATELY 4'-0" ABOVE THE FLOOR AND AT LEAST 3'-0" FROM WALL, COLUMN, AND OTHER LARGE SURFACES CAPABLE OF ALTERING THE MEASUREMENTS.
- a. MAXIMUM NOISE CRITERIA FOR ALL SPACES SHALL NOT EXCEED NC 25.
4. PERFORM SOUND TESTINGS AT LOCATIONS ON PROJECT FOR EACH OF THE FOLLOWING SPACE TYPES, AT A MINIMUM:
- a. OPEN AREA.
- b. OFFICES.

I. TOLERANCES.

1. SUPPLY AND EXHAUST FANS: 0% TO PLUS 5%.
2. AIR OUTLETS AND INLETS: 0% TO PLUS 5%.

J. FINAL REPORT.

1. GENERAL: PROVIDE TYPEWRITTEN OR COMPUTER PRINTOUT IN LETTER-QUALITY FONT, ON STANDARD BOND PAPER, IN THREE-RING BINDER, TABULATED AND DIVIDED INTO SECTIONS BY TESTED AND BALANCED SYSTEM.
- a. INCLUDE A CERTIFICATION SHEET IN FRONT OF BINDER, SEALED AND SIGNED BY THE TESTING AND BALANCING ENGINEER.
- b. INCLUDE A LIST OF INSTRUMENTS USED FOR PROCEDURES, ALONG WITH PROOF OF CALIBRATION.
2. GENERAL REPORT DATA: IN ADDITION TO FORM TITLES AND ENTRIES, INCLUDE THE FOLLOWING DATA IN THE FINAL REPORT, AS APPLICABLE.
- a. TITLE PAGE.
- b. NAME AND ADDRESS OF TAB FIRM.
- c. PROJECT NAME AND LOCATION.
- d. ARCHITECTS NAME AND ADDRESS.
- e. ENGINEERS NAME AND ADDRESS.
- f. MECHANICAL CONTRACTORS NAME AND ADDRESS.
- g. REPORT DATE.
- h. TABLE OF CONTENTS WITH THE TOTAL NUMBER OF PAGES (NUMBER EACH PAGE IN REPORT) DEFINED FOR EACH SECTION OF THE REPORT.
- i. SUMMARY OF CONTENTS INCLUDING THE FOLLOWING:
- 1). INDICATED VERSUS FINAL PERFORMANCE.
- 2). NOTABLE CHARACTERISTICS OF SYSTEMS.
- 3). DESCRIPTION OF SYSTEM OPERATION SEQUENCE IF IT VARIES FROM THE CONTRACT DOCUMENTS.

K. INSPECTIONS.

1. INITIAL INSPECTION.
- a. AFTER TESTING AND BALANCING ARE COMPLETE, OPERATE EACH SYSTEM AND RANDOMLY CHECK MEASUREMENTS TO VERIFY THAT THE SYSTEM IS OPERATING ACCORDING TO THE FINAL TEST AND BALANCE READINGS DOCUMENTED IN THE FINAL REPORT.
- 1). RANDOMLY CHECK THE FOLLOWING FOR EACH SYSTEM:
- a). MEASURE AIRFLOW OF AT LEAST 10% OF AIR OUTLETS.
- b). MEASURE ROOM TEMPERATURE AT EACH THERMOSTAT.
- c). MEASURE SPACE PRESSURE OF AT LEAST 10% OF LOCATIONS.
- d). BALANCING DEVICES ARE MARKED WITH FINAL BALANCE POSITION.

2. FINAL INSPECTION.

- a. AFTER INITIAL INSPECTION IS COMPLETE AND EVIDENCE BY RANDOM CHECKS VERIFIES THAT TESTING AND BALANCING ARE COMPLETE AND ACCURATELY DOCUMENTED IN THE FINAL REPORT, REQUEST THAT A FINAL INSPECTION BE MADE BY THE ARCHITECT AND OWNER.
- 1). TAB FIRM TEST AND BALANCE ENGINEER SHALL CONDUCT THE INSPECTION IN THE PRESENCE OF THE ARCHITECT AND OWNER.
- b. ARCHITECT AND OWNER SHALL RANDOMLY SELECT MEASUREMENTS DOCUMENTED IN THE FINAL REPORT TO BE RECHECKED.
- 1). THE RECHECKING SHALL BE LIMITED TO EITHER 10% OF THE TOTAL MEASUREMENTS RECORDED, OR THE EXTENT OF THE MEASUREMENTS THAT CAN BE ACCOMPLISHED IN A NORMAL 8-HOUR BUSINESS DAY.
- c. IF THE RECHECKS YIELD MEASUREMENTS THAT DIFFER FROM THE MEASUREMENTS DOCUMENTED IN THE FINAL REPORT BY MORE THAN THE TOLERANCES ALLOWED, THE MEASUREMENTS SHALL BE NOTED AS "FAILED".
- 1). IF THE NUMBER OF "FAILED" MEASUREMENTS IS GREATER THAN 10% OF THE TOTAL MEASUREMENTS CHECKED DURING THE FINAL INSPECTION, OR A SOUND LEVEL OF 2 db OR MORE GREATER THAN THAT RECORDED IN THE REPORT LISTINGS, THE TESTING AND BALANCING SHALL BE CONSIDERED INCOMPLETE AND SHALL BE REJECTED.
- a). IN THE EVENT THE REPORT IS REJECTED, ALL SYSTEMS SHALL BE READJUSTED AND TESTED, NEW DATA RECORDED, NEW CERTIFIED REPORTS SUBMITTED, AND NEW INSPECTIONS TEST MADE, ALL AT NO ADDITIONAL COST.
- d. TAB FIRM SHALL RECHECK ALL MEASUREMENTS AND MAKE READJUSTMENTS.
- 1). REVISE THE FINAL REPORT AND BALANCE DEVICE SETTINGS TO INCLUDE ALL CHANGES AND RESUBMIT THE FINAL REPORT.
- e. REQUEST A SECOND FINAL INSPECTION.
- 1). IF THE SECOND FINAL INSPECTION ALSO FAILS, THE OWNER SHALL CONTRACT THE SERVICES OF ANOTHER QUALIFIED TAB FIRM TO COMPLETE THE TESTING AND BALANCING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND DEDUCT THE COST OF THE SERVICES FROM THE FINAL PAYMENT OF THE ORIGINAL TAB FIRM.

3.2 EQUIPMENT REPORT TEST DATA.

- A. TEST DATA REQUIREMENTS: PROVIDE THE FOLLOWING, AS A MINIMUM, INDICATED AND ACTUAL VALUES PER EACH PIECE OF SYSTEM TESTED.

1. EXHAUST FANS.

- a. TOTAL AIRFLOW RATE IN CFM.
- b. TOTAL SYSTEM STATIC PRESSURE IN INCHES WG.
- c. FAN RPM.
- d. DISCHARGE AND SUCTION STATIC PRESSURE IN INCHES WG.

2. ROOFTOP UNITS.

- a. TOTAL AIRFLOW RATE IN CFM.
- b. TOTAL SUPPLY AND RETURN AIRFLOW RATE IN CFM.
- c. TOTAL SUPPLY FAN STATIC PRESSURE IN INCHES WG.
- d. SUPPLY FAN RPM.
- e. DISCHARGE STATIC PRESSURE IN INCHES WG.
- f. FILTER STATIC PRESSURE DIFFERENTIAL IN INCHES WG.
- g. OUTSIDE AIRFLOW RATE IN CFM.
- h. OUTSIDE AIR DAMPER POSITION.
- j. OUTSIDE AIR ENTERING AND LEAVING AIR TEMPERATURE IN DEGREES F.

3. AIR TERMINAL DEVICES.

- a. AIRFLOW RATE IN CFM.
- b. AIR VELOCITY IN FPM.
- c. PRELIMINARY AIRFLOW RATE AS NEEDED IN CFM.
- d. PRELIMINARY VELOCITY AS NEEDED IN FPM.
- e. FINAL AIRFLOW RATE IN CFM.
- f. FINAL VELOCITY IN FPM.
- g. NOISE CRITERIA (NC).
- h. SPACE TEMPERATURE IN DEGREES F.

4. RECTANGULAR AND ROUND DUCTWORK.

- a. SYSTEM AND ROOFTOP UNIT NUMBER.
- b. DUCT STATIC PRESSURE IN INCHES WG.
- c. DUCT SIZE IN INCHES.
- d. ACTUAL AIRFLOW RATE IN CFM.
- e. ACTUAL VELOCITY IN FPM.

3.3 DUCTWORK PRESSURE (TIGHTNESS) TESTING

1. ALL DUCTWORK AND PLENUM SYSTEMS SHALL BE SEALED AND PRESSURE TESTED USING INSTRUMENTS AND PROCEDURES SPECIFIED IN ANSI ASHRAE 152 AND ASTM E1554 TEST METHOD "A", AND INTERNATIONAL ENERGY CONSERVATION CODE SECTION 403.
- A. EXCEPTION: DUCT TIGHTNESS TEST IS NOT REQUIRED IF THE AIR HANDLER AND ALL DUCTS ARE LOCATED WITHIN THE CONDITIONED SPACE.



IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE LAW FOR ANY PERSONS, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT OR PROFESSIONAL ENGINEER, TO ALTER IN ANY WAY PLANS, SPECIFICATIONS, OR REPORTS TO WHICH THE SEAL OF A LICENSED ARCHITECT OR PROFESSIONAL ENGINEER HAS BEEN APPLIED.



0	ISSUED FOR REVIEW & COMMENT	09-10-2021
REV.	DESCRIPTION	DATE

Plumbing & Mechanical, Inc.

3198 UNION ROAD
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CADD@MLPCORP.COM
WWW.MLPCORP.COM

**KINDERKIDZ DAYCARE
MECHANICAL DETAILS**

PROJECT MANAGER: DWMUSKOPF
COORDINATOR: TWATT
FIELD FOREMAN: [blank]

JOB NUMBER: [blank]
DATE CREATED: March 12, 2021
SCALE: [blank]

DRAWING NUMBER

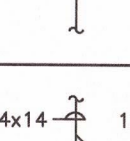
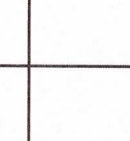
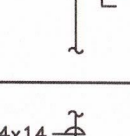
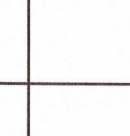
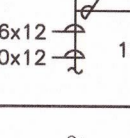
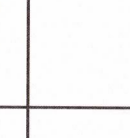
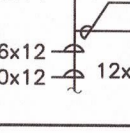
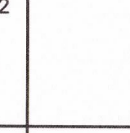
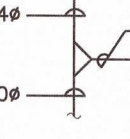
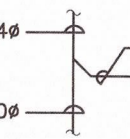
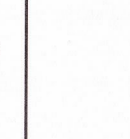
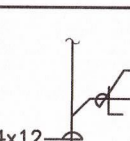
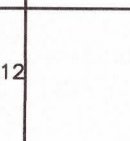
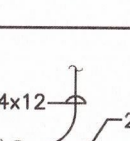
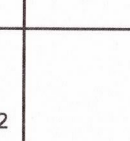
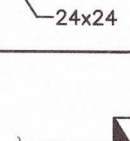
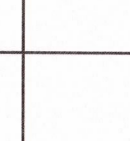
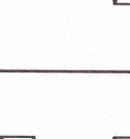
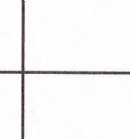
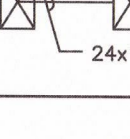
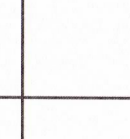
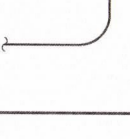
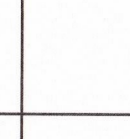
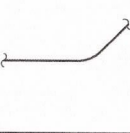
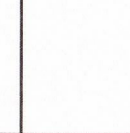
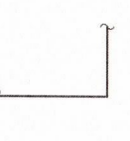
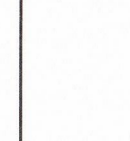
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ABBREVIATIONS AND SYMBOLS

ABBREVIATIONS

ACCU	AIR COOLED CONDENSING UNIT	HPWS	HEAT PUMP WATER SUPPLY
ADJ	AIR CONDITIONING UNIT	HT	HEIGHT
ADZ	ADDRESS BOARD	HV	HEATING
ADJ	ADJUSTABLE	HVTU	HEATING VENTILATING UNIT
CF7	CANAL FINISHED FLOOR	HW	HOT WATER SUPPLY
AHU	AIR HANDLING UNIT	HWRT	HOT WATER RETURN
ARCH	ARCHITECTURAL	HWT	HOT WATER
ATV	ATMOSPHERIC VENT	HX	HEAT EXCHANGER
BD	BOILER	LAT	LEAVING AIR TEMPERATURE
BBT	BOILER BLOW DOWN	LPS	LOW PRESSURE CONDENSATE
BF	BOILER FEED	LPSST	LOW PRESSURE STEAM
BS	BOILER STOP	LRT	LEAVING RADIATOR TEMPERATURE
BD	BOTTOM OF DUCT	LWA	LEAVING WATER TEMPERATURE
BTU	BOTTOM OF SLUIT	LWT	LEAVING WATER TEMPERATURE
	BRITISH THERMAL UNITS/HOUR	MA	MIXED AIR
C	CONDENSER WATER SUPPLY	MAU	MAKE-UP AIR UNIT
CD	COOLING COIL	MD	MOD. BULB AIR
CC	CONDENSATE	MM	MINIMUM CIRCUIT AMPS
CEF	CeILING EXHAUST FAN	MCC	MOTOR CONTROL CENTER
CF	CUBIC FEET PER MINUTE	MPC	MEDIUM PRESSURE CONDENSATE
CH	CHILLER	MPS	MEDIUM PRESSURE STEAM
CH	CHILLING WATER RETURN	N/C	NORMALLY CLOSED
CS	CIRCUIT SETTER	N/C	NOT IN CONTRACT
CS	COILING TUBE	N/C	NORMALLY OPEN
CUH	CABINET UNIT HEATER	NTS	NOT TO SCALE
CUH	CHILLED WATER CIRCULATING PUMP	OD	OUTDOOR AIR
CWR	CHILLER WATER RETURN	PC	PUMPER CONDENSATE
CWS	CHILLED WATER SUPPLY	PCH	PREHEAT COIL
		PMP	PUMP
DB	DRAIN	PPE	PUMP ROOF EXHAUSTER
DB	DIRECT DIGITAL CONTROL	PRP	PRESSURE REDUCING VALVE (PSID)
DIA	DIAMETER	PRV	POUNDS PER SQUARE FOOT
DMP	DAMPED MOTOR	PSI	POUNDS PER SQUARE INCH
DMP	DAMPER	PTAC	PACKAGED TERMINAL AIR CONDITIONER
DWG	DRAWING	QTY	QUANTITY
DX	DIRECT EXPANSION	RA	RELIEF AIR
EA	EXHAUST AIR	RD	REFRIGERANT DISCHARGE
EAT	ENTERING AIR TEMPERATURE	RTN	RETURN AIR
EBR	ELECTRIC BASEBOARD RADIATION	RH	RELATIVE HUMIDITY
ED	ELECTRIC DIRECT RADIATION	RHC	REHEAT COIL
EE	ELECTRIC EXHAUST FAN	RH	REFRIGERANT LIQUID
ELC	ELECTRIC	RL	REVOLUTIONS PER MINUTE
ESP	EXTERNAL STATIC PRESSURE	RTU	ROOF TOP UNIT
EXT	EXTERNAL WATER TEMPERATURE	RTU	RELIEF WATER VALVE (PSID)
EWT	ENTERING WATER TEMPERATURE	SA	SUPPLY AIR
FBI	FURNISHED BY OTHERS	SD	SMOKE DAMPER
FD	FAN COIL UNIT	SF	SUPPLY FAN
FD	FIRE DAMPER	SP	STATIC PRESSURE
FD	FUEL LOAD AMPS	SPC	SPECIFICATION
FD	FUEL OIL DISCHARGE	SQ	SQUARE FOOT
FD	FUEL OIL RETURN	SS	STAINLESS STEEL
FD	FUEL OIL GALLON	SS	SUSPENDED UNIT HEATER
FD	FUEL OIL FLOW		
FDV	FUEL OIL SUPPLY		
FD	FUEL OIL TANK VENT		
FDV	FEET PER MINUTE	TP	TEMPERATURE CONTROL PANEL
FR	FRESH AIR	TOP	TOP OF DUCT
FR	FRESH AIR RETURN	TOP	TOP OF STEEL
FS	FRESH AIR SUPPLY	TPR	TEMPERED WATER RETURN
FS	FRESH AIR SUPPLY	TWS	TEMPERED WATER SUPPLY
GPM	GALLONS PER MINUTE	TV	TYPICAL
GS	GLYCOL RETURN	U	UNIT HEATER
	GLYCOL, GLYCOL MIXTURE	UV	UNIT VENTILATOR
HC	HEATING COIL	VAC	VACUUM
HC	HOT GAS	V	VARIABLE AIR VOLUME
HP	HORSEPOWER	VAV	VOLUME DAMPER
HP	HIGH PRESSURE CONDENSATE	VD	VALVE
HP	HIGH PRESSURE STEAM	VC	WITH
HPWS	HEAT PUMP WATER RETURN	WB	WET BULB
		WC	WATER COLUMN

HEATING SYMBOL LIST					
—A—	COMPRESSED AIR	—RL—	REFRIGERANT LIQUID	FD—	FIRE DAMPER
—ATV—	ATMOSPHERIC VENT	—	REFRIGERANT SUCTION	BD—	BACK DRAFT DAMPER
—BBD—	BOILER BLOW DOWN	—VAC—	VACUUM	SD—	SMOKE DAMPER
—BF—	BOILER FEED	—RS—	DOMESTIC COLD WATER	AMD—	AUTOMATIC AIR DAMPER
—C—	CONDENSER WATER SUPPLY	—R—	PITCH UP/INCLINE RISE	FC—	FLEX CONNECTION
—CR—	CONDENSER WATER RETURN	—D—	PITCH DOWN/INCLINE DOWN	—VD—	VOLUME DAMPER (VD)
—CWR—	CHILLED WATER RETURN		EXPANSION COMPENSATOR WSGUIDES		TRANSITION SQUARE/ROUND
—CWS—	CHILLED WATER SUPPLY		EXPANSION JOINT WSGUIDES		DUCT SECTION - SUPPLY
—D—	DRAIN		THERMOSTATIC TRAP ASSEMBLY		DUCT SECTION - RETURN/EXHAUST
—FOF—	FUEL OIL FILL		FLOAT AND THERMOSTATIC TRAP ASSEMBLY		FLAT - DIMENSION SHOWN "A" - "B" - OTHER
—FOG—	FUEL OIL GAUGE		BUCKET TRAP ASSEMBLY		ROUND DUCT
—FOR—	FUEL OIL RETURN		THERMODYNAMIC TRAP ASSEMBLY		FLAT - OVAL DUCT
—FOS—	FUEL OIL SUCTION		STRAINER		THERMOMETER
—FOV—	FUEL OIL TANK VENT		DIRECTION OF FLOW		PRESSURE GAUGE
—G—	GAS		REDUCER		AIR VENT
—GR—	GLYCOL RETURN		CAR OR PLUG		THERMOMETER/TEST/CONTROL WELL
—GS—	GLYCOL SUPPLY		ELBOW DOWN		UNDERCUT DOOR 1"
—HG—	REFRIGERANT HOT GAS		ELBOW UP/TOP CONNECTION		LOUVERED DOOR, INDICATES SQ. FT. FREE AREA
—HPC—	HIGH PRESSURE CONDENSATE		BOTTOM CONNECTION		AIR FLOW
—HPS—	HIGH PRESSURE STEAM		UNION OR FLANGE		PNEUMATIC THERMOSTAT
—HPWR—	HEAT PUMP WATER RETURN		VALVE (SHUT-OFF)		WITH GUARD
—HPWS—	HEAT PUMP WATER SUPPLY		GLOBE VALVE		TEMPERATURE SENSOR
—HWR—	HOT WATER RETURN		CHECK VALVE		ELECTRIC THERMOSTAT
—HWS—	HOT WATER SUPPLY		CONTROL VALVE		HUMIDISTAT
—LPC—	LOW PRESSURE CONDENSATE		SAFETY RELIEF VALVE		ACOUSTIC THERMAL LINING
—LPS—	LOW PRESSURE STEAM		TRIPLE DUTY VALVE		SOUND ATTENUATOR
—MPC—	MEDIUM PRESSURE CONDENSATE		BALANCING COCK		NEW TO EXISTING CONNECTION
—MPS—	MEDIUM PRESSURE STEAM		FLOW BALANCER		POINT BETWEEN EXISTING TO BE REMOVED AND EXISTING TO REMAIN
—PC—	PUMPED CONDENSATE		PRESSURE REDUCING VALVE		WORK TO BE REMOVED
—RD—	REFRIGERANT DISCHARGE		CONVECTOR DEPTH-LENGTH-HEIGHT-MBH		

HEATING SYMBOL LIST	
	SUPPLY AIR TAKE OFFS  $\frac{1}{2}$ TIMES BRANCH SIZE VD 12x12
	SUPPLY AIR TAKE OFFS  $\frac{1}{2}$ TIMES BRANCH SIZE VD 12w
	SUPPLY AIR TAKE OFFS  $\frac{1}{2}$ TIMES BRANCH SIZE VD 24x14 8x12 12x12 16x12 20x12
	SUPPLY AIR TAKE OFFS  $\frac{1}{2}$ TIMES BRANCH SIZE VD 24x14 8x12 12x12 16x12 20x12
	SUPPLY AIR TAKE OFFS  24ø 8ø CONICAL TEE 20ø
	SUPPLY AIR TAKE OFFS  24ø 8ø CONICAL TEE 20ø
	EXHAUST OR RETURN AIR FITTING  VD 12x12 $\frac{1}{2}$ TIMES BRANCH SIZE
	90° VERTICAL SPLIT OFF (PLAN VIEW)  24x12 24x24 24x12
	DUCT THRU ROOF 
	DUCT TURNING 90° DOWN  TURN DOWN 24x12 TURN UP
	LONG RADIUS 90° ELBOW R = W  R W
	LONG RADIUS 45° ELBOW R = W  R W
	90° ELBOW WITH TURNING VANES 
	FLEX DUCT FROM DIFFUSER TO 4-WAY PATTERN UNLESS OTHERWISE INDICATED 

HVAC GENERAL NOTES LIST

A. CONTRACTOR IS RESPONSIBLE FOR PROPER FIELD FITTING AND QUANTITY OF WORK. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AS REQUIRED AND BE RESPONSIBLE FOR FITTING NEW CONSTRUCTION TO EXISTING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR ANY EXISTING CONDITIONS DISTURBED OR DAMAGED DURING CONSTRUCTION (TO MATCH EXISTING) AT NO COST TO OWNER.

B. CONTRACTOR IS RESPONSIBLE FOR SITE INVESTIGATION PRIOR TO START OF WORK TO REVEAL EXISTING CONDITIONS.

C. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL DRAWINGS AND SPECIFICATIONS AND COORDINATE WORK WITH ALL OTHER TRADES.

D. PROVIDE ALL CUTTING, PATCHING AND FIRE STOPPING REQUIRED TO ACCOMPLISH WORK. PATCH AND REPAIR ALL EXISTING CONDITIONS INCLUDING EXISTING WALLS, FLOORS, CEILINGS, ETC. UNLESS OTHERWISE INDICATED. COORDINATE ALL WORK IN FINISHED AREAS UNLESS OTHERWISE INDICATED ON DIRECTED BY THE ARCHITECT.

E. CONTRACTOR FIELD REPAIRS SHALL INCLUDE: CRACKS, DIMENSIONS AND EXISTING TO NEW CONSTRUCTION. CONTRACTOR SHALL COORDINATE ALL FIELD REPAIRS PRIOR TO EQUIPMENT, PIPING, AND DUCTWORK TO BE INSTALLED. CONTRACTOR SHALL COORDINATE ALL FIELD REPAIRS, TRANSITIONS, OFFSETS, ELEVATION CHANGES, ETC. TO MINIMIZE CONFLICTS WITH EXISTING CONDITIONS.

F. DRAWINGS ARE SCHEMATIC AND SERVE TO INDICATE THE TYPE AND LOCATION OF MAJORITY OF EQUIPMENT. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL MATERIAL, MATERIALS, AND LABOR REQUIRED TO COMPLETE THE WORK. CONTRACTOR LOCATE THE LOCATION OF ALL DUCTWORK, PIPING, WIRING, EQUIPMENT, AND CONTROLS TO ACCOMMODATE ALL EXISTING STRUCTURE CONDITIONS. IF UNENCOUNTERED, OBTAIN APPROVAL FROM THE ENGINEER FOR ALL BUT MINOR CHANGES. ALL CHANGES EQUIPMENT AND METHODS SHALL BE FULLY ACCESSIBLE AND MAINTAINABLE.

G. INSTALL ALL EQUIPMENT AND SYSTEMS IN COMPLETE COMPLIANCE WITH GOVERNING CODES. MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SPECIFICATIONS.

H. ALL PHYSICAL ATTRIBUTES OF EQUIPMENT AND DEVICES ARE BASED ON MANUFACTURER'S LISTED ON CONTRACT DOCUMENTS AND EQUIPMENT SCHEDULES. THE RESPECTIVE CONTRACTORS ARE RESPONSIBLE FOR ALL CHANGES BROUGHT ABOUT BY THE USE OF ITEMS BY OTHER MANUFACTURERS AT NO COST TO OWNER. THE CONTRACT ENGINEER HAS REVIEWED THE LISTED ITEMS FOR OTHER MANUFACTURERS FOR REASONS INCLUDING, BUT NOT LIMITED TO, THOSE ITEMS NOT MATCHING THE PHYSICAL ATTRIBUTES OF THE MANUFACTURER LISTED.

I. COORDINATE DUCT INSTALLATION WITH ELECTRICAL DEVICES. DO NOT INSTALL DUCTWORK IN PROHIBITED LOCATIONS SUCH AS ABOVE ELECTRICAL PANELS, WITHIN ELECTRICAL RACKS, ETC. COMPLY WITH NEC REQUIREMENTS.

J. CONTRACTOR IS RESPONSIBLE FOR COLLECTION OF ALL DEBRIS AND DEPOSITING SAME DAILY, IN CONTAINERS PROVIDED BY OWNER. OFF SITE DISPOSAL OF ALL DEBRIS AND DEBRIS TO BE PROVIDED BY CONTRACTOR AND COMPLY WITH ALL LOCAL CODES.

K. SA AND RA DUCTWORK LOCATED WITHIN CONDITIONED ENVIRONMENT, NO INSULATION REQUIRED. SA AND RA DUCTWORK LOCATED OUTSIDE OF CONDITIONED ENVIRONMENT PER SCHEDULE AND SPECIFICATIONS. SA AND RA DUCTWORK, EXTERIOR TO THE BUILDING TO BE INSULATED WITH 1" BOARD INSULATION. SA AND RA DUCTWORK, EXTERIOR, OVER AND AROUND DUCTWORK TO BE INSULATED FIRST 10' INSIDE CONDITIONED ENVIRONMENT IF POSSIBLE. ALL PLenum BOIES TO BE INSULATED WITH 1" MM) BOARD INSULATION.

MINIMUM DUCT AND PLENUM INSULATION							
DUCT TYPE	MINIMUM R VALUE	TYP. FIBERGLASS		TYP. CELLULOSE		RIGID FIBERGLASS (P-4.8/F7+3)	
		R/INCH	MIN. THICKNESS REQ. (IN)	R/INCH	MIN. THICKNESS REQ. (IN)	R/INCH	MIN. THICKNESS REQ. (IN)
SUPPLY AIR, RETURN AIR, PLENUMS (UNCONDITIONED SPACES)	R-6	3.5	1.7	3.1	1.9	4	1.5
SUPPLY AIR, RETURN AIR, PLENUMS (OUTSIDE)	R-12	3.5	3.4	3.1	3.9	4	3
SUPPLY AIR, RETURN AIR (CONDITIONED SPACES); EXHAUST AIR - FIRST 10'	R-6	3.5	1.7	3.1	1.9	4	1.5

NOTES:

1. PROVIDE INSULATION WITH FACTORY APPLIED JACKET (A.S.I. OR FSK) ON UNEXPOSED DUCT, ALUMINUM POL. BURN ON EXPOSED DUCT (FSK), INDOORS. ALUMINGUARD ON ALL EXTERIOR DUCTS.

MINIMUM PIPE INSULATION THICKNESS ^{A, C}										
FLUID OPERATING TEMPERATURE RANGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)							
	CONDUCTIVITY ^B BTU / IN-HR-FT-°F	MEAN RATED TEMPERATURE ^B (°F)	1/2	3/4	1	1 1/2	2	3	4	NOTES
> 350	0.03 - 0.34	200	4.5	1	1.0	1.5	2.2	3.0	3.8	
251 - 350	0.29 - 0.32	200	3	4	4	4.5	4.5	4.5	1	
201 - 250	0.29 - 0.32	150	2.5	2.5	2.5	2.5	2.5	2.5	3	1
151 - 200	0.25 - 0.29	125	1.5	1.5	1.5	1.5	2	2	2	1
105 - 140	0.20 - 0.26	100	1	1	1	1.5	1.5	1.5	1.5	1
40 - 100	0.21 - 0.27	75	0.5	0.5	0.5	1	1	1	1	1
< 40	0.20 - 0.26	50	0.5	0.5	1	1	1	1	1	1

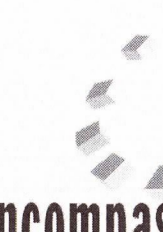
NOTES:

A FOR PIPE SMALLER THAN 1/2 INCHES AND LOCATED IN PARTITIONS WITH CONDITONED SPACE, REDUCTION OF THESE THICKNESSES BY 1 INCH SHALL BE PERMITTED (BUT NOT TO A THICKNESS LESS THAN 1 INCH)

B FOR INSULATION OUTSIDE THAT STATED CONDUCTIVITY RANGE, THE MINIMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:
 $T = (1 - (P/R)XK - 1)$
WHERE:
T = MINIMUM INSULATION THICKNESS
P = ACTUAL OUTSIDE RADIUS OF PIPE
R = INSULATION THICKNESS LISTED IN THE TABLE FOR APPLICABLE FLUID TEMPERATURE AND PIPE SIZE
K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATED TEMPERATURE INDICATED FOR THE APPLICABLE FLUID TEMPERATURE RANGE (BTU / IN-HR-FT-°F)
 $k = \frac{P}{k} = \text{THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THE TABLE FOR THE APPLICABLE FLUID TEMPERATURE}$

C FOR DIRECT-BURN HEATING AND/OR HOT WATER SYSTEM PIPE, REDUCTION OF THESE THICKNESSES BY 1/2-INCHES (8 MM) SHALL BE PERMITTED (BUT NOT TO THICKNESSES LESS THAN 1 INCH)

D PROVIDES AS FOR ALL INDOOR PIPE INSULATION. PROVIDES PVC COVERS ON ALL FITTING INSULATION. PROVIDES PVC/CAST ALUM. EXTERIOR INSULATION.



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IT IS A VIOLATION OF SECTION 2209, SUBDIVISION 3, OF THE NEW YORK STATE LAW FOR ANY PERSONS, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT OR PROFESSIONAL ENGINEER, TO ALTER IN ANY MANNER PLANS, SPECIFICATIONS OR REPORTS TO WHICH THE SEAL OF A LICENSED ARCHITECT OR PROFESSIONAL ENGINEER HAS BEEN APPLIED.

SEAL:



0	ISSUED FOR REVIEW & COMMENT	03-13-2021
REV	DESCRIPTION	DATE



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**KINDERKIDDD DAYCARE
MECHANICAL DETAILS**
GRAND ISLAND, NY

PROJECT MANAGER
DAMIUSKOFF

COORDINATOR
TWTAT

FIELD FOREMAN

JOB NUMBER

DATE CREATED
March 12, 2021

SCALE

DRAWING NUMBER

SM 0110

1. A MECHANICAL WORKMAN IS SUBJECT TO GENERAL REQUIREMENTS OF CONTRACT. ALL ARTICLES SHOWN DRAWING OR MENTIONED IN THE SPECIFICATIONS TOGETHER WITH ANY NECESSARY FOR INCIDENTAL TO THE COMPLETION OF THE WORK SHALL BE FURNISHED AND INSTALLED BY THE RESPONSIBLE CONTRACTOR UNLESS OTHERWISE STATED. ALL ADJUSTMENTS SHALL BE MADE AND SYSTEM TURNED OVER TO THE OWNER IN WORKING ORDER.

2. IT IS THE INTENT OF THESE SPECIFICATIONS THAT THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR, MATERIAL SUPPLIES EQUIPMENT TRANSPORTATION ETC. REQUIRED TO PLACE INTO SATISFACTORY OPERATION THE SYSTEMS DESCRIBED. THE ACCOMPANYING DRAWINGS AND THESE SPECIFICATIONS ARE SCHEMATIC ONLY. THE MECHANICAL CONTRACTOR SHALL BE REQUIRED TO INSTALL SYSTEMS IN THE BEST WORKMANSHIP MANNER AND EQUAL TO ACCEPTED STANDARDS OF THE ART. PROCEDURES RUNS ARE SHOWN AS DIAGRAMS AND MAY BE MODIFIED BUT THE GENERAL AGREEMENT SHALL BE AS SHOWN. DEVIATIONS FROM THE AGREEMENT SHOWN MUST HAVE APPROVAL OF THE ARCHITECT. ARRANGE IN A NEAT MANNER FOR ACCESS TO OTHER WORK INSTALLED BY OTHER TRADES. ALL PIPES AND DUCTS TO BE CONCEALED IN WALLS AND CEILINGS EXCEPT WHERE OTHER WISE NOTED.

3. LAYS CODES PERMITS AND INSPECTION

A. FILE ALL PLANS AND PAY FOR NECESSARY PERMITS AND INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION OVER THIS WORK

B. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH ALL APPLICABLE FEDERAL STATE ENERGY CONSERVATION AND LOCAL CODES AND ORDINANCES AS WELL AS THE LATEST ADDITION OF THE NATIONAL ELECTRIC CODE THIS SHALL INCLUDE ANY SERVICE COMPANY RULES REGULATIONS OR ORDINANCES HAVING JURISDICTION OVER THIS WORK. THESE CODES SHALL SUPERSEDE THE SPECIFICATIONS AND DRAWINGS

C. AT THE COMPLETION OF THE WORK THE ELECTRICAL CONTRACTOR SHALL DELIVER TO THE OWNER A CERTIFICATE OF INSPECTION AND ACCEPTANCE OF THE WORK BY THE LOCAL INSPECTION AUTHORITY A COPY OF THIS DOCUMENT SHALL BE FORWARDED TO THE ARCHITECT AND ENGINEER

D. EXAMINATION OF PREMISES AND SITE. IN SUBMITTING PROPOSALS FOR THIS WORK EACH BIDDER WILL BE HELD RESPONSIBLE FOR HAVING PREVIOUSLY EXAMINED THE SITE AND OR PREMISES AND SATISFIED HIMSELF AS TO THE CONDITION UNDER WHICH HE WILL BE OBLIGED TO OPERATE SHOULD HE BE AWARDED THE CONTRACT TO PERFORM THE WORK. NO EXTRA COMPENSATION WILL BE ALLOWED HERE NEW WORK IS EFFECTED BY THE EXISTING JOB CONDITION

5. GUARANTEE THE CONTRACTOR SHALL GIVE WRITTEN GUARANTEE UPON FINAL ACCEPTANCE OF THE WORK AGAINST DEFECTIVE WORKMANSHIP MATERIALS OR DEFICIENCIES SHOWN WITHIN THE PERIOD OF FINAL ACCEPTANCE BY THE OWNER. THE CONTRACTOR AGREES TO PROMPTLY CORRECT SUCH DEFECTS WITHOUT COST TO THE OWNER ARCHITECT OR ENGINEER

6. SCHEDULE OF OPERATION THE CONTRACTOR SHALL DO ALL WORK ON AN APPROVED SCHEDULE AND IN A MANNER THAT WILL AVOID UNDUE INTERFERENCE WITH OTHER CONTRACTORS ON THIS PROJECT

7. SUPERVISION THE CONTRACTOR SHALL PERSONALLY SUPERVISE THE WORK OF DELEGATE THE RESPONSIBILITY TO A COMPETENT SUPERINTENDENT WHOSE QUALIFICATIONS ARE ACCEPTABLE TO THE OWNER ARCHITECT AND ENGINEER

8. EQUIPMENT AND MATERIALS: EQUIPMENT AND MATERIAL FURNISHED UNDER THIS CONTRACT SHALL BE NEW UNLESS OTHERWISE SPECIFIED LISTED BY THE UNDERWRITERS LABORATORIES AND SHALL BE OF THE SAME MARK WHERE USED FOR SIMILAR PURPOSES

9. TESTS AND INSPECTIONS

A. THE ENTIRE INSTALLATION SHALL BE KEPT FREE FROM SHORT CIRCUITS AND IM PROPER GROUNDS

AT THE COMPLETION OF THE PROJECT THE CONTRACTOR SHALL CONDUCT A TWO (2) HOUR TEST WITH ALL ELECTRICAL UTILIZATION EQUIPMENT ENERGIZED DURING THIS PERIOD A CLOSE WATCH SHALL BE KEPT ON ALL PANELS AND CONNECTIONS TO LOCATE ANY DEFECTIVE APPARATUS OR WORKMANSHIP. PARTICULAR ATTENTION SHALL BE PAID TO THE LOAD BALANCE ON THE VARIOUS PANELS AND FEEDERS. WIRING DEVICES AND APPLIANCES FOUND TO BE FUNCTIONING IMPROPERLY SHALL BE REPAIRED IMMEDIATELY AT THE CONVEYANCE OF THE OWNER. ANY REQUIRED SHORT CIRCUITS THAT BECOME APPARENT SHALL BE CARRIED OUT IMMEDIATELY

10. MARKING AND LABELING A PROVIDE ENGRAVED NAMEPLATES FOR ALL DISCONNECTS, STARTERS PANEL BOARDS, TIMERS, CABINETS ENCLOSURES ETC. NAMEPLATES SHALL IDENTIFY THE ASSOCIATED EQUIPMENT BEING SERVED. THE NAMEPLATE SHALL BE PLASTIC LAMINATE WITH 3/16" BLACK ENGRAVED LETTERS ON A WHITE BACKGROUND ATTACHED USING BOLTS NUTS AND WASHERS

11. MAKE CERTAIN THAT ALL CIRCUIT BREAKERS IN ALL PANEL BOARDS ARE IDENTIFIED BY ROOM NUMBER AND OR NAME, EQUIPMENT SERVED OR OTHER APPROPRIATE DESIGNATION. PANELS SHALL BE PROVIDED WITH DOOR MOUNTED TYPE WRITTEN DIRECTORIES UNDER CLEAR PLASTIC

12. INSTRUCTION THOROUGHLY INSTRUCT THE OWNERS REPRESENTATIVE IN THE PROPER OPERATION OF ALL EQUIPMENT

12. FINAL CLEANING: AFTER TESTS HAVE BEEN MADE AND THE INSTALLATION HAS BEEN FOUND SATISFACTORY BY THE ENGINEER THOROUGHLY CLEAN THE ENTIRE INSTALLATION. BOTH EXPOSED SURFACES AND INTERIORS REMOVE ALL DEBRIS CAUSED BY THE WORK UNDER THIS CONTRACT FROM ALL SPACES INSIDE AND OUTSIDE THE BUILDING. AT COMPLETION OF WORK CLEAN ALL FIXTURES AND METAL WORK AND LEAVE IN POLISHED CONDITION

13. CONDUIT AND RACEWAY

A. ALL CONDUIT SHALL BE ELECTRICAL METALLIC WITH SET SCREW FITTINGS EMT SHALL BE DELIVERED TO THE JOB SITE IN TEN FOOT LENGTHS AND SHALL BEAR ALL UL LABEL AND MANUFACTURERS NAME OR TRADEMARK

B. THE ELECTRICAL RACEWAY SYSTEM SHALL BE INDEPENDENTLY ATTACHED OF SUPPORTED FROM THE BUILDING STRUCTURE AND SHALL RUN PARALLEL WITH OR PERPENDICULAR TO THE STRUCTURAL MEMBER

C. SUPPORT AND ATTACHMENTS PROVIDED SHALL BE SPECIFICALLY DESIGNED FOR THE INSTALLATION PERFORATED HANGERS OR WIRE TIE SUPPORTS ARE NOT ACCEPTABLE

D. ALL RACEWAY PASSING THROUGH A FIRE SEPARATION SHALL BE A FIRE RATED INSTALLATION

E. CONDUIT SHALL BE INSTALLED IN ORDER THAT CONTINUOUS GROUNDING PATH IS ESTABLISHED

14. CONDUCTORS

A. ALL WIRE AND CABLE SHALL BE NEW WITHIN ONE YEAR OF MANUFACTURE WHEN DELIVERED TO THE JOB SITE AND BEAR THE UL LABEL INSULATION TYPE VOLTAGE RATING AND MANUFACTURERS NAME AT REGULAR INTERVALS ON THE INSULATION JACKET

B. ALL SINGLE CONDUCTOR WIRING IN RACEWAYS SHALL BE STRANDED COPPER 600 VOLT RATED TYPE THHN, THWN 90 C

C. ALL MULTI CONDUCTOR CABLE FOR BRANCH CIRCUIT WIRING SHALL BE TYPE MC ARMORED CABLE (COPPER) WITH CONTINUOUS INSULATED GROUNDING CONDUCTOR

D. ALL CONTROL CABLE RUN EXPOSED IN THE CEILING SPACE FOR COMMUNICATIONS TELEPHONE DATE ETC SHALL BE TEFLON JACKETED AND BE LISTED FOR USE IN AN AIR HANDLING PLenum

E. JOINTS TAPPING AND END OF WIRE OF SIZE #10 AND SMALLER SHALL BE MADE WITH SCOTCHLOK TYPE SPRING CONNECTOR SIZES #8 AND LARGER SHALL BE MADE WITH COMPRESSION CONNECTORS

15. OUTLETS AND WIRING DEVICES

A. BOXES AND FITTINGS FOR CONCEALED WORK SHALL BE PRESSED STEEL, CADMIUM COATED OR ZINC GALVANIZED AS MANUFACTURED BY RACO, STEEL CITY, UNIVERSAL OF EQUAL IN CONCEALED WORK INSTALL ALL BOXES SO THAT THE FRONT EDGES DO NOT PROTRUDE BEYOND THE FINISHED WALL SURFACE. OUTLET BOXES SHALL BE 4" SQUARE OR OCTAGONAL NOT LESS THAN 1 1/2" DEEP IN ALL CASES THEY SHALL BE OF A SIZE AND SHAPE ESPECIALLY ADAPTED TO THE PARTICULAR USE TO WHICH THEY ARE PUT WHERE SPACE LIMITATIONS DICTATE 2" X 4" BOXES MAY BE USED IF OF PROPER VOLUME AS DICTATED BY NEC

B. RECEPTACLES SHALL BE DUPLEX GROUNDING TYPE, 202 1/2 VOLT SPECIFICATION GRADE WITH BRUSHED STEEL COVER PLATE GROUND FAULT INTERRUPTER (GFI) AND ISOLATED GROUND (IG) TYPE RECEPTACLES SHALL BE PROVIDED IN LOCATIONS AS INDICATED. COLOR SHALL BE AS SELECTED BY THE ARCHITECT

C. SWITCHED SHALL BE SINGLE POLE, THREE WAY OR FOUR WAY AS INDICATED 20A 120-277V SPECIFICATION GRADE QUIET TYPE WITH BRUSHED STAINLESS STEEL COVER. COLOR SHALL BE AS SELECTED BY THE ARCHITECT

16. GROUNDING

A. ALL EQUIPMENT GROUNDING CONNECTORS SHALL BE COMPLETELY CONNECTED PRIOR TO ENERGIZING EQUIPMENT. THE ENTIRE RACEWAY SYSTEM SHALL COMPOSE A CONTINUOUS GROUND FROM THE INITIAL GROUND CONNECTION TO THE FURTHEST OUTLET

B. ALL RECEPTACLES SHALL HAVE A SEPARATE GROUNDING CONDUCTOR INSTALLED FROM THE GROUND TERMINAL ON THE DEVICE TO THE METALLIC BOX

C. ELECTRIC SERVICE GROUNDING SHALL MEET THE REQUIREMENTS OF THE LATEST ADDITION OF THE NFPA NATIONAL ELECTRICAL CODE

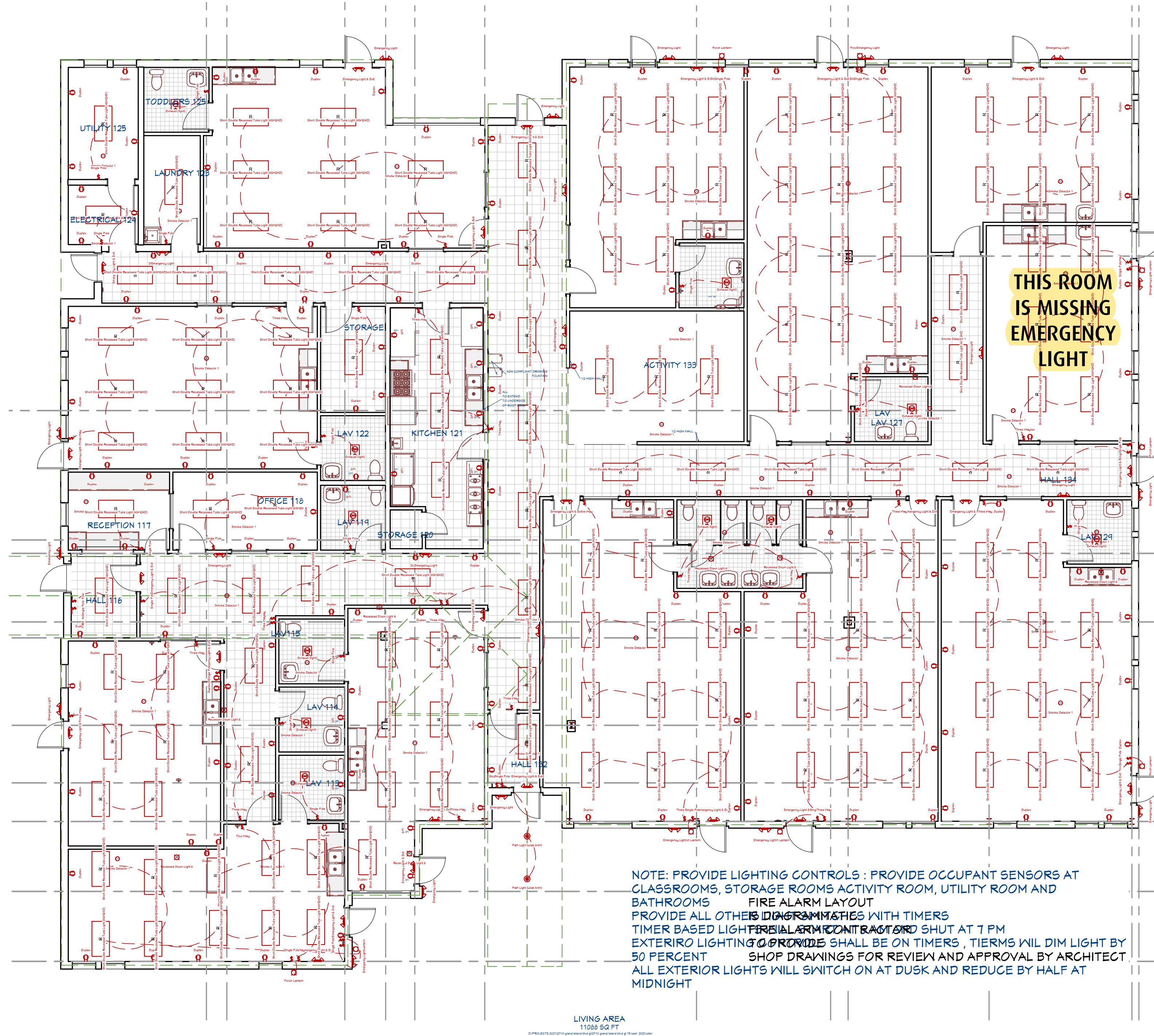
11. SHOP DRAWINGS AND MANUFACTURERS DATA: THE CONTRACTOR SHALL SUBMIT WITH SUCH PROMPTNESS AS TO CAUSE NO DELAY IN HIS WORK OR THAT OF OTHER CONTRACTORS PROVIDE EIGHT (8) COPIES OF ALL SHOP DRAWINGS OR DESCRIPTIVE LITERATURE ON ALL EQUIPMENT TO BE SUPPLIED AND THE ENGINEER SHALL REVIEW THEM WITH REASONABLE PROMPTNESS

AS BUILT DRAWINGS: AT THE COMPLETION OF THE ELECTRICAL WORK THE CONTRACTOR RESPONSIBLE FOR THE WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE AS BUILT DRAWINGS

NOT TO SCALE

BROOKLYN BRIDGE									
DESCRIPTION	QUANTITY	PRICE	UNIT	DATE	REMARKS	LOCATION	DATE	BY	REMARKS
	001	11	1	2"	12"	1.14"	CEILING	CHINA LIGHT	
	002	22	1	8.98"	8.98"	14.50"	WALL	EMERGENCY LIGHT & EXIT	
	003	33	1	3"	34"	5"	WALL	SINGLE POLE	
	004	12	1	3"	35.5"	5"	WALL	011	
	005	3	1	2"	34"	5"	WALL	FOUR PMV	
	006	44	1	3"	35.5"	5"	WALL	DUPLEX	
	007	8	1	1.90"	1.30"	0.76"	CEILING	REGRESSED DOWN LIGHT 8	
	008	35	1	5"	5"	7.10"	CEILING	SHOCK DETECTOR 1	
	009	1	1	1.14"	1.170"	0.14"	WALL	HOME ALARMY CONTROL UNIT	
	010	60	1	40"	24"	104"	CEILING	SHORT DOUBLE REGRESSED TUBE LIGHT (40W)	
	011	24	1	3"	34"	5"	WALL	THREE PMV	
	012	6	1	3"	47"	33"	WALL	PORCH LANTERN	
	013	2	1	3"	18.5"	18.14"	FLOOR	PATH LIGHT (FIDE BRN)	
	014	1	1	3"	34"	5"	GABINET	SINGLE POLE	
	015	25	1	8.98"	8.98"	14.50"	WALL	EMERGENCY LIGHT	BARRON LIGHTING
	016	2	1	8.98"	8.98"	14.50"	WALL	EXIT/EMERGENCY LIGHT	BARRON LIGHTING

NOT TO SCALE



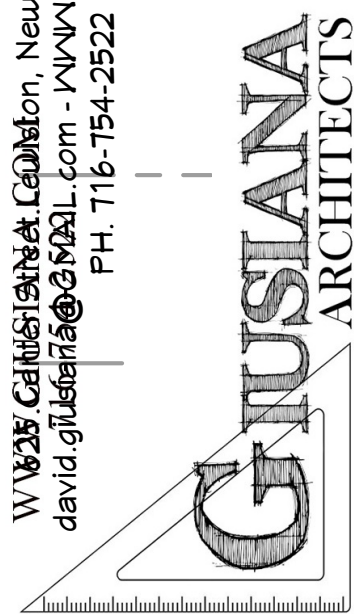
NOTE: PROVIDE LIGHTING CONTROLS: PROVIDE OCCUPANT SENSORS AT CLASSROOMS, STORAGE ROOMS ACTIVITY ROOM, UTILITY ROOM AND BATHROOMS
FIRE ALARM LAYOUT
PROVIDE ALL OTHER DIAGRAMMATIC WITH TIMERS
TIMER BASED LIGHTING CONTROL: MOTOR SHUT AT 2 PM
EXTERIOR LIGHTING: PROVIDE SMALLER NUMBERS, TERMS WILL DIM LIGHT BY 50 PERCENT
ELECTRIC SWINGS FOR REVIEW AND APPROVAL BY ARCHITECT
ALL EXTERIOR LIGHTS WILL SWITCH ON AT DUSK AND REDUCE BY HALF AT MIDNIGHT

SCALE: 1/8" = 1'-0"

REVISIONS:	DATE
DESCRIPTION	

ISSUE DATE: 28 oct 2020	JOB NO. DCG PROJECTS 2020 2710 GRAND ISLAND BLVD GRAND ISLAND	NO
Drawn By: DCG Checked By: dca		

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E-1